Final Draft - Coordinated Resource Management Plan

by

PATRICK TRUMAN & ASSOCIATES
&
PACIFIC WATERSHED ASSOCIATES

for

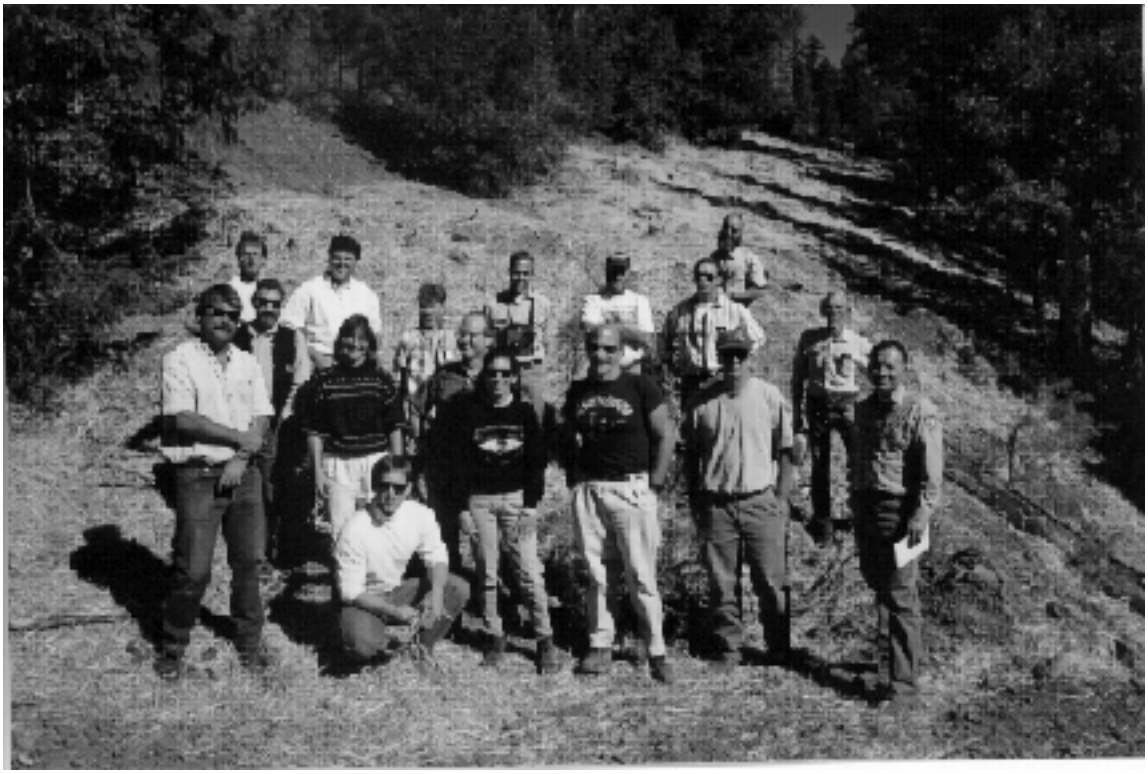
SOUTH FORK TRINITY RIVER
COORDINATED RESOURCE MANAGEMENT STEERING COMMITTEE

with assistance from the

TRINITY RIVER RESTORATION PROGRAM

January 1996

Comments and/or questions should be addressed to CRMP Coordinator, Box 81, Weaverville, CA 96093



The South Fork CRMP Committee Field Trip to East Fork Smoky Creek Restoration Projects.

The South Fork CRMP Committee Field Trip to Butter Creek Restoration Projects.

TABLE OF CONTENTS

I. The Role of a Coordinated Resource Management Plan

Coordinated Resource Management and Planning (CRMP) is a resource planning, problem solving, and management (decision making) process that allows for direct participation of everyone (stakeholders) concerned with resource management in a given planning area. The concept underlying CRMP is that coordinating resource uses results in improved resource management and minimizes conflict among land users, landowners, government agencies, and interest groups. Using this approach, resource problems are addressed and solved much more effectively because they are based on resource boundaries; they are not constrained by individual, agency, or political boundary.

The CRMP process operates on the local level with the underlying philosophy being that those who live, work, and recreate on a given piece of land are the people most interested in and capable of developing plans for its use. Inevitable conflicts in resource use that arise from diverse interest and goals are best solved by face-to-face communication among all interested groups and individuals. Experience has shown that people with diverse viewpoints who voluntarily meet together as a planning team will find common ground as they interact with one another and have a chance to observe resource problems first hand. Through discussion, landowners, users, and resource managers begin to understand and respect each other's viewpoints. The end result is constructive problem solving through cooperative resource planning.

The local focus of the CRMP process makes community support essential. Community awareness of the constructive, problem solving nature of the plan strengthens the commitment of those involved in the planning group to make the plan work. In addition, news of the successful implementation of the CRMP process in an area can stimulate surrounding areas to follow suit, reducing resource conflicts throughout a region.

II. Goals and Objectives of the South Fork Trinity River CRMP:

Goals:

- Develop and Implement a coordinated resource management plan for the recovery of the fisheries and economies of the South Fork Trinity River Basin.
- Promote equality, cooperation and voluntary participation among all members of the CRMP process.
- Build trust.

Objectives:

- Provide the leadership necessary to bring diverse interest groups to agreement on resource management opportunities.

- Perform upland watershed analysis and inventory.
- Determine risk potential for sediment yield from private and public land.
- Assess water quality and quantity improvement opportunity.
- **Strive to** prevent listing of species under the Endangered Species Act through habitat improvement and population recovery.
- Increase forest productivity through soil conservation.
- Provide access to, and facilitate transfer of, technical information and expertise.
- Serve as a liaison between the agencies, industries and local grass roots groups.

III. General Description of Planning Area:

A. Geographic Boundaries

The South Fork Trinity River is one of four, large sub-basin areas of the Trinity River basin. The Trinity River, in turn, is the largest tributary of the Klamath River, itself the subject of an on-going fishery restoration program.

The South Fork Trinity River watershed encompasses 980 square miles, over 600,000 acres. The convergence of the South Fork with the main stem of the Trinity River is located approximately 4 miles upstream of the community of Willow Creek, California (Appendix B). The South Fork of the Trinity River is the largest undamed wild and scenic river remaining in California and was once widely known for its annual runs of wild anadromous salmonids.

B. Physiography & Stream Morphology

The terrain of the South Fork basin is dissected and mountainous, with ridge crest elevations from 1,200 to 2100 meters. Slopes are steep with local relief to 700 meters. The watershed is elongate in a northwest direction, which parallels the prevalent structural trend of the underlying geology. Nick points in the stream profile occur at geologic boundaries.

Vestiges of old erosional and depositional surfaces are recognized in places. Ridges of approximately the same altitude and the dissected remains of pre-existing broad valleys are visible, suggesting that relief was generally low before the region was uplifted and dissected by the present drainage system (Irwin et al. 1974). One such elevated surface is the area around Indian Valley, west of Hayfork and southeast of Hyampom.

To estimate the uplift-erosion cycle, Kelsey (1977) used fossiliferous Pliocene marine beds. His data suggests that the rate of uplift in the Van Duzen watershed 10 km to the west has been between 24 and 40 cm per thousand years since the end of the Miocene, 5 million years ago.

Other evidence of recent rapid uplift are step-like terrace deposits along the South Fork Trinity. These deposits are particularly well preserved near Forest Glen, Hyampom, and above the confluence with the mainstem Trinity River near Salyer. There are six terrace levels represented. Meanders in the riverbed are also deeply incised in these areas and the presence of steep slopes and high erosion rates indicates that uplift is rapid enough to keep up with erosion.

C. Climate

The climate of the basin is determined largely by its proximity to the Pacific Ocean. Hot, dry summers and cold wet winters are typical. In summer, mountain temperatures around 100 degrees fahrenheit generally warm the ocean breezes and increase their capacity to hold moisture. In winter, westerly winds from the Pacific are cooled by the Coast Range and Klamath Mountains. Precipitation is therefore highly seasonal, with 90% falling between October and April.

Mean annual precipitation varies from 39 inches on the east side of the basin to 78 inches on the west side along South Fork Mountain. Winter temperatures are below freezing and snow is common at elevations above 4,000 feet. Snow typically remains on the higher peaks through mid-June.

D. Vegetation

The most characteristic natural vegetation are stands of Douglas fir intermixed with ponderosa and sugar pine, and less commonly, incense cedar. At elevations above 1200 meters, white fir shares the overstory with Douglas fir in proportions that increase with elevation. Hardwoods are frequently found as intermediate associates. Scattered digger pines are found associated with calcic soils derived from serpentinized ultarmafic rocks at lower elevations.

Brush and hardwoods rapidly invade openings in the forest caused by fire and timber harvest. Common brush species are white thorn, manzanita, deer brush, bush chinquapin, blackberry, raspberry, and poison oak. Common hardwoods are black oak, canyon and interior live oak, madrone, tan oak, giant chinquapin, bigleaf maple, and alder.

E. Human Distribution Patterns

The population of the South Fork Trinity River is limited by the rugged terrain. The latest census data available for 1995 suggests that the population of the South Fork area, including Hayfork (2600), Hyampom (288) Wildwood (75) and the Lower South Fork (85) is approximately 3,000 according to the CA Dept. of Finance. The majority of the population is clustered in the Hayfork Valley, on ranches averaging 782 acres, in several housing subdivisions and larger individual parcels. The population is also scattered throughout the valley in villages such as Summit Creek Road, Barker Valley, Tule Creek, Wildwood, Peanut and Salt Creek.

Jedediah Smith was the first white man to explore the Hayfork Valley in 1828. Hayfork is a timber dependent community where the social and economic situation of the community is intertwined with the lumber industry.

While timber plays a major role in this community, secondary occupations dealing with recreation, home occupations, gold mining, and government industries also make a significant contribution to the local economy.

Native Americans indigenous to this area are the Wintu. Many of these people still maintain traditional values and practices. Native Americans commonly maintain a continuing interest in the area. In some cases, this interest is in the production of forest commodities which continue to provide employment opportunities. Other individuals are concerned with management practices that may affect traditional commodities obtained from the forest. The availability of these products for spiritual and/or personal use is of concern. The Nor-El-Muk band of Wintu Indians is currently seeking federal recognition.

The lower South Fork was populated by people of the Tsnungwe Tribe. Land use by the Tsnungwe were the typical low impact patterns of most native peoples of the Trinity River Basin. White miners coming into the area often married daughters of Indian families, gaining land rights but keeping land in the family at the same time. The Tsnungwe Tribe is also seeking federal recognition.

F. Land Ownership Patterns and Acreage

The South Fork of the Trinity River is one of four sub-basins of the Trinity River watershed. The South Fork watershed encompasses 980 square miles, over 600,000 acres of land. Ownership is 21% private and 79% public. There are 92 miles of mainstem and 585 miles of tributaries in the watershed.

The Hayfork Valley watershed area (largest tributary to the South Fork) includes approximately 191,000 acres in public ownership and 52,000 acres of private land. Private land use is as follows (NRCS PL-566 Environmental Assessment 1994):

Land Use	**Acres**
Pasture and hayland	2,100
Timberland	34,600
Grazing land	10,000
Urban land	1,000
Other	4,300
Total Private Land	52,000

The land above the valley floor is mainly timberland. There are approximately 191,000 acres of Forest Service managed timberland and 34,000 acres of private timberland. The potentially irrigable land in the Hayfork Valley area totals approximately 2,100 acres. Of this, 1,300 acres currently receive irrigation water. The remaining 800 acres are not presently irrigated. (NRCS PL-566 Environmental Assessment 1994)

A second large "block" of private land is found on the east facing slope of South Fork Mountain. This land is almost entirely timbered and dedicated to commercial forestry operations by a relatively small number of large timberland owners.

G. Land Use Patterns

1. Timber Harvesting

Prior to the commencement of intensive logging in the 1940s, 80% of the South Fork basin was covered in fir and pine forest, with 20% in brush, grass and rock. Since that time, human impact to the basin has been substantial. By 1977, 52% of the watershed had already been logged and an additional 4% of the old growth had been burned. Total road length visible on aerial photos was 3,456 miles, 92% of which were associated with timber harvests. An undetermined but substantial amount of additional acreage has been affected by logging, road construction and wildfires in the basin since the CA Dept. of Water Resources 1977 inventory.

Federal lands within the central portion of the South Fork Trinity River watershed were the site of intensive selective logging in the 1950s, under a concept called "unit area control". Much of this area, included gentler, upland areas extending from Rattlesnake Creek to Wildwood to Philpot Creek. Management practices were poor, including skid trails and landings located in drainages, and high road densities. Clearcut logging did not commence on National Forest lands in the South Fork watershed until the 1970s. Under this cultivation system, the Forest Service implemented a patchcut grid on much of their ownership. Oversight and control of plan layout, logging techniques and road building practices were minimal during this early period of land use.

In the lower basin, timber harvesting began on the upland private holdings on South Fork Mountain in the late 1950s. From 1957-1960 logging on private lands resulted in removal of timber from up to 47% of some watersheds. Most of the intensive harvesting of timber from private lands on South Fork Mountain was conducted in the 1950s, 1960s and 1970s. Nearly all yarding was done by tractors, resulting in dense networks of roads, landings and skid trails. Road densities ranged from 7.4 to 11.2 miles per square mile and occupied from 5.8 to 7.8% of the area. (CADWR 1977)

2. Urban / Rural Development

Urban development in the South Fork basin has primarily occurred in the Hayfork Valley along Hayfork Creek, covering approximately 1,000 acres. Over the past two decades rural development has occurred in the outlying areas such as Summit Creek, Barker Valley, Wildwood, Peanut and Salt Creek as larger ranches were subdivided or parcels split off. Population of the Hayfork Valley as determined by Zip Code is estimated to be 2,600 according to the CA Dept. of Finance.

Hyampom, located at the confluence of Hayfork Creek and the South Fork, is a small village of approximately 288 people. Following the Wintu in the upper valley and the Tsnungwe Tribe on the lower South Fork this area was settled by gold miners, followed by lumberjacks, ranchers and retirees.

3. Ranching and Agriculture

Pasturing, hay production and grazing occur on approximately 14,000 acres in the South Fork basin, primarily in the Hayfork Creek watershed where there are 51 surface water diversions listed in the California Department of Water Resources records. There are currently 18 active ditch diversions in the watershed. Due to economic conditions, most of the diversions are made of rocks and plastic sheeting, and reconstructed each year. Two concrete diversion structures exist, one on Hayfork Creek and one on Big Creek. The present diversions have marginal to fair provisions for low flow fish passage and fish screens. The earth diversion ditches convey water to the irrigated pastures. At the beginning of the irrigation season the ditches have an estimated 50-90% loss rate due to seepage and evapotranspiration. By the end of July, the losses can prevent any irrigation of the pastures. Additional unquantified diversions are by pump systems placed in the creek.

4. Recreation

Motorized recreation is on the increase throughout the South Fork. Local residents utilize the extensive public road network for hunting, fishing, and camping. Black-tailed deer, black bear, and a variety of waterfowl and upland game birds are commonly hunted. Traditional forms of recreation such as hiking, skiing and equestrian use are on the increase and newer forms of recreational activities such a mountain biking and use of ORVs are increasing.

In the summer months deep pools in the mainstem are used for swimming and relaxation. Backpacking and horseback riding in the Yolla Bolly and Chanchelulla Wilderness Areas offer respite, and hiking through the Chinquapin and South Fork Roadless Areas are increasingly becoming more popular. On lower Hayfork Creek, BAR 717 Camp provides horseback riding, swimming and other recreational activities.

5. Mining

Beginning in 1856, Hayfork became an active mining locality with a population of several hundred miners. In 1857, new diggings were reported in Carrier Gulch. Nuggets ranging from $18 to $30 in value were found. Later that year, The Kellogg Diggings attracted attention and soon 150 miners were busy washing for gold at that site, and reportedly produced a good yield. In 1863, rich finds were made on Salt Creek, about 4 miles south of Hayfork.

Most of the gold recovered in the Hayfork Valley has been by dragline dredging, while in the upstream sections gold was recovered by hydrolicking. All things considered, mining along Hayfork Creek and the South Fork Trinity River was relatively minor, even though it was the primary economic activity until WW II, when logging became predominant.

Mining on the mainstem South Fork was minimal, and was not an important factor in land use. The only large mine was the Swanson Mine, near the beginning of South Fork Road. It impacted the mainstem Trinity at Salyer, but not the South Fork.

H. Water Use and Yield Patterns

The average yearly rainfall in the South Fork basin is nearly 35 inches. Creeks in the Hayfork watershed have summer flows varying from 0 to 13 cfs after water is diverted for irrigation. In an average water year, a total of 91 cfs per day can be diverted, about 7.3 acre-ft/year. (NRCS PL-566 Environmental Assessment 1994)

The supply of water in the Hayfork Valley in dry years is not sufficient for current users and to meet beneficial use under the public trust doctrine. This water supply problem has led to legal challenges between water users in the area, studies of water availability, and to designation of the area by Trinity County as a Critical Water Resource Overlay Zone (CWR).

Only an estimated 13% of water currently diverted from Hayfork Creek and its tributaries in the CWR area have recognized permits according to NRCS (1994). Most water users operated under riparian rights for which no statement of diversion and use has been filed. Build-out on existing undeveloped riparian parcels can be expected to double water demands. A survey of parcel owners who are currently using water indicated that they can be expected to increase their use of water in the future. The NRCS (1970) reported that ground water is limited in the Hayfork Valley - drilling of wells will be of limited utility in meeting future water needs.

IV. History of South Fork CRMP Committee

The initial meeting of landowners and agencies interested in developing a Coordinated Resource Management Plan Group was held in October 1993. This was a key recommendation published in the DRAFT "Action Plan for Restoration of Fisheries in the South Fork Trinity River", prepared by Pacific Watershed Associates, an environmental consulting firm contracted by the Trinity River Restoration Program (TRRP). An initial list of Goals and Objectives was developed for the formation of a CRMP, and agreement was reached on the development of this group as a "Steering Committee" that will seek the support from landowners necessary to make this a formal CRMP.

Nadine Bailey and Patrick Truman agreed to volunteer their time as Co-Coordinators of the Steering Committee. The Natural Resources Conservation Service (NRCS) and Trinity Resource Conservation District (RCD) committed staff to provide technical and administrative assistance to the Steering Committee. It was agreed that an inventory of landowners in the South Fork Basin is needed, and that an effort should begin to make contact with them with regard to their resource needs and desires. A non-point source grant to fund Hayfork Creek water conservation and riparian improvements with landowners was submitted, but not awarded to the CRMP.

In December, 1993 the TRRP received a written request from a consortium of private interests including fisheries groups, private timber interests, the California Forestry Association and other groups, asking that the TRRP financially support a South Fork Trinity River CRMP. The TRRP acknowledged the benefits of a Coordinated Plan for the South Fork Trinity River by allocating $277,000 in funding to support CRMP Steering Committee goals and objectives.

These funds were committed to the following activities: 1) Butter Creek Private Land Restoration Contract to Redwood Community Action Agency; 2) CRMP formation and Coordinator Contract; 3) Private Land Watershed Assessments (in East Fork South Fork Trinity River); and 4) Private Land Water Conservation and Riparian Improvements.

Early in January, 1994 the Steering Committee agreed to adhere to the philosophy of being action-oriented and science-based, rather than serving as a philosophical or perception-based group. Duties of the CRMP Coordinator were agreed upon by the group. It was also agreed that a component of the CRMP process should be to develop a spirit of cooperation with the Forest Service so that the CRMP efforts result in hiring local people who would complete sound, integrated resource restoration projects on public and private lands. Also in January, the RCD and NRCS sponsored formation of a sub-group of the CRMP to solicit local landowners involvement in completing water conservation and riparian improvements in the Hayfork Valley. Fourteen people, including six landowners, participated in this effort.

The Forest Service, in February, 1994, presented its new approach to watershed management mandated by the Forest Ecosystem Management Assessment Team report and the upcoming decision on option 9, the President's Forest Plan for Management of Habitat for Late-Successional and Old-Growth Related Species Within the Range of the Northern Spotted Owl. The process of "watershed analysis" was defined in relation to watershed restoration. A draft Memorandum of Understanding (MOU-Appendix A) for formation of a formal CRMP was circulated for comment. The MOU is intended to serve as a commitment of landowners, interested parties, and agencies to work together on the issues which the group agrees are important to the South Fork Trinity River. The Hayfork Creek Subgroup met again and prioritized the subwatersheds entering Hayfork Valley on the basis of fisheries values and water conservation and riparian needs.

The final report by Pacific Watershed Associates on the restoration of the South Fork Trinity River was released to the public in March 1994. An ongoing effort to seek additional funds to complete water conservation and riparian improvements in Hayfork was presented to the Committee. Eighty landowners in three priority tributaries were contacted to determine their interest in voluntarily completing riparian improvements funded through a proposal process with the CA Department of Fish and Game. Eighteen landowners expressed interest in participating in the proposal process at that time.

A pilot project for the CRMP water conservation and riparian initiative was presented to the CRMP Committee in April, 1994. Steve Beck, new owner of the Carr Creek Ranch in the Hayfork Valley, agreed to complete both water conservation measures and riparian protection work on his property. The California Conservation Corps agreed to donate labor for the project to install protective fencing and plant riparian vegetation, with materials and leadership provided by the RCD/NRCS Team. Another initiative aimed at completing an inventory of upland erosion hazards in the East Fork South Fork Trinity River, a key branch of the South Fork known for its fisheries value, was presented and approved in concept by the Committee. A tour, hosted by the Forest Service Yolla Bolly Ranger District, reviewed the implementation of road projects intended to reduce erosion in the Smoky Creek watershed.

In May, 1994, members of the CRMP Steering Committee appeared before the Trinity County Board of Supervisors to explain the role and function of the South Fork CRMP. The committee requested, and received unanimous support for Trinity County becoming the first signatory on the MOU. The Humboldt Resource Conservation District agreed to support the CRMP effort on the Humboldt County side of the watershed. The CRMP Steering Committee also sponsored an essay contest for Hayfork, CA. High School Students, raising nearly $400 in pledges for the top five participants. The issue of shaded fuel breaks throughout the South Fork Trinity River basin was discussed by the group, with agreement that this is a concern. Nadine Bailey traveled to Washington DC carrying this group's unanimous concern about a lack of adequate fire protection.

The California Department of Fish and Game released some initial estimates on anadromous fish populations in tributaries of the South Fork, in June of 1994. The assessment suggested a very successful season for young-of -the year, perhaps due to the wet 1993 winter. The first stage of mailings to landowners in the South Fork Trinity River began with 600 letters sent to landowners. By the June meeting, 125 people had responded to the mailing, with 50 positive responses requesting assistance on resource issues or asking for more information. Five additional landowners attended and shared their views at the Hyampom meeting. The RCD/NRCS team developed a proposal to assist the Tsnungwe Tribe in completing an upland erosion and cultural resource inventory on Madden Creek.

The South Fork CRMP Coordinator position was advertised in July, 1994. The Conservation District and the Six Rivers National Forest became signatories to the MOU, and at the July meeting several other individuals, groups, and agencies committed to signing the MOU. 1,400 letters were sent to the rest of the identified landowners in the South Fork Basin, with responses back from nearly 300 individuals. The private land inventory work, in preparation for completing restoration projects and hiring local contractors in Butter Creek Watershed, was explained by Steve Madrone of the Redwood Community Action Agency. The Forest Service announced that watershed analysis is nearing completion on Butter Creek, and should lead to implementation of identified restoration projects by 1995. The California Department of Fish and Game awarded the RCD a $10,000 grant to complete riparian improvements on streamside properties in Tule, Carr, and Salt Creeks tributary to Hayfork Creek. The TRRP approved a budget for 1995 that included $275,000 for supporting CRMP-related activities in the South Fork Trinity River.

Water conservation projects were planned for implementation in August, 1994. One project was a 3,300 foot piped irrigation ditch which would reduce losses from ditches by up to 90%. This improved efficiency means that 90% of the water previously diverted in the Tule and Carr Creek systems would be expected to run free-flowing as surface stream flows in the future. Local material suppliers and labor were used to complete the work, under the direction of the RCD/NRCS team.

The water quality and water quantity demonstration project on Steve Beck's land on Carr Creek in the Hayfork Valley was completed and a dedication ceremony was held in September, 1994. Eighty additional letters have subsequently been mailed to landowners in the Tule, Salt and Carr Creek watersheds and the CRMP received 25 replies, with 14 requesting assistance. The CRMP Coordination contract with Patrick Truman & Associates was awarded in August 1994.

A sub-committee was formed to delineate staff roles and responsibilities and prioritization of watersheds within the South Fork Basin. Sediment level and fishery surveys were completed on

Hayfork and Rusch Creeks. Five categories of work are being undertaken in the Hayfork Creek watershed include: 1) Five strategic water monitoring locations; 2) water conservation projects; 3) Riparian planting; 4) livestock exclusionary fencing, and; 5) stream surveys.

In October, 1994, the RCD/NRCS team began a plan to monitor flows to establish a long term record. Discussions began on the utilization of the USGS gauging station on Hayfork Creek. Approximately 400 of the 1600 information post cards that were mailed had been returned. Fortyseven landowners indicated that they wanted to participate in the CRMP; 110 wanted more information; 24 wanted assistance with erosion control; 16 requested assistance/information on fisheries; 27 wanted assistance with roads; 30 had forestry concerns; 14 had other concerns; and 132 were not interested. The Steering Committee drafted a letter to the Forest Service regarding collaboration with the CRMP and the Trinity River Restoration Program on Watershed Analysis in the South Fork.

The Steering Committee, in November of 1994, began the development of an educational program by requesting Americorp volunteers to prepare an informational flyer, through county schools, on the fate of the salmon/coho/steelhead. The Steering Committee also approved the final draft of the roles and responsibilities of staff. The Steering Committee also instructed the Coordinator to draft a letter to the Forest Service delineating the CRMP's priority of watersheds within the South Fork Basin. The Steering Committee was presented a draft outline for the CRMP plan developed by Pacific Watershed Associates. Jesse Miller, Americorp Regional Coordinator for Adopt-A-Watershed gave a background on the program and how they can collaborate with the CRMP. CRMP staff also began development of a funding flow chart for landowners outlining general requirements, time-lines, cost-sharing, and limitations.

The South Fork watershed priorities were adopted by the Steering Committee in January 1995. By then there were 59 landowner requests for technical assistance planned on private lands for FY 95: 19 riparian habitat; 5 fisheries; 5 forestry; 9 road erosion; 7 stream bank erosion; and five water conservation. A sub-committee was formed to finalize the educational flyer, and the outline for the CRMP Plan was finalized. CRMP staff began the development of a public slide presentation. Hayfork Fairgrounds turned over the operation of the gauging station in Hayfork Creek to RCD/NRCS team. Six Rivers NF, Humboldt RCD and Randall Cook entered into a cooperative agreement to implement over $100,000 of restoration work on the Cook House property in Grouse Creek.

In March 1995 RCD/NRCS team began implementing the Riparian Habitat Improvement Project with 14 separate landowners in the Hayfork Creek basin and hired five local people from the Hayfork area. The project was partly funded through CA Fish & Game Salmon Restoration Report Card program. A letter was sent to 58 additional landowners in the Big Creek, Carr Creek and Salt Creek watersheds asking if they would like to be involved in the project and there were seven responses. The CRMP Committee directed that staff develop a letter to Representatives Frank Riggs and Wally Herger regarding the committees support for reauthorization of the Trinity River Restoration Program.

Hayfork Adaptive Management Area (AMA) Coordinators Julia Riber and John Veevaert began giving monthly updates to the Steering Committee on the development of a plan for the AMA.

The Committee also approved the final draft of the educational flyer. Redwood Community Action Agency was in the process of developing a plan identifying various restoration projects on private land in Butter Creek. The Committee reviewed the draft educational slide presentation being developed by the RCD.

The Forest Service, in April, 1995, presented a status report on their projects in Butter Creek in which they had $400,000 in funding to accomplish work. A tour of this area was planned for June. Redwood Community Action agency also reported on the private lands inventory and project development within the Butter Creek watershed. The RCD submitted three new proposals to DF&G for riparian work on Big Creek, Salt Creek and Carr Creek. Eighteen responses had been received from recently contacted landowners. A spring conservation tour was hosted at Steve Beck's ranch which highlighted the CRMP's demonstration project of water conservation and riparian improvements to 50 attendees. The CRMP sponsored neighborhood fuels reduction demonstration projects was toured by the Committee and completed that month. Americorp members also completed and distributed the Salmon "Sink or Swim" laminated educational poster. The Committee also adopted a CRMP Logo, approved a "long-term resident outreach" proposal, and accepted the draft Fisheries Enhancement Funding Sources chart.

The CRMP Committee toured the Forest Service Butter Creek projects with 22 participants in June, 1995. Carol Joroski, funded by NRCS under the PL 566 program presented the strategy for the development of conservation plans for landowners within the Hayfork Creek basin. The Committee accepted a draft water quality & quantity monitoring plan developed by the RCD. The Committee recommendation is to expand the monitoring program by accessing additional funds. The Hayfork Adaptive Management Area coordinator reported that a draft guide would be developed by September 1995. Simpson Timber presented a review of two timber harvest plans within the watershed and explained the road inventory being conducted by Pacific Watershed Associates with funding from the Northwest Emergency Assistance Program.

In August, 1995, updates were presented to the Committee on the Murrison Big Creek Ranch where five streambank erosion projects were identified, and Carr Creek where there was extensive streambank erosion of pasture land. The CRMP Committee agreed to support a trade of two unroaded parcels of land that PG&E is scheduled to liquidate in the lower South Fork, for public land, resulting in a no net-loss of private land A letter of support was sent to The Trust for Public Land. The RCD retained the same personnel under contract that DF&G used in the past to continue monitoring spring run steelhead. A 319(h) and 205(j) grant applications were completed and submitted to the Regional Water Quality Control Board. The 319(h) was for project implementation while the 205(j) was for monitoring.

An update was presented by the RCD, at the September 1995 Committee meeting, on the implementation of the Hayfork Basin monitoring plan, and the need to establish a baseline water chemistry condition to identify areas of concern. This information was also being made available to the local water district to help support a wastewater treatment facility for the town of Hayfork. Water temperature and riparian enhancement projects were also being monitored. The road inventory on private timberlands utilizing displaced fishermen was proceeding well.

The 319(h) and 205(j) grant applications submitted to the North Coast Regional Water Quality Control Board were ranked number three and two respectively. John Veevaert, Hayfork AMA

Coordinator reported that Joyce Anderson was appointed the new South Fork Management Unit Ranger. Amelia Berol reported on the progress of the Outreach Project and suggested that a series of informational meetings be held. There was also discussion on the possible development of a Salt Creek Watershed Analysis and reauthorization of the Trinity River Restoration Program.

The CRMP Steering Committee agreed to sponsor a one-day workshop on road decommissioning approaches and techniques, primarily for staff on the Shasta-Trinity National Forest. At the November 1995 Committee meeting, the RCD presented an update of completed projects in the Carr/Rusch/Big/Gates Creeks watersheds funded by USF&WS Jobs in the Woods funding. Seven culverts were replaced, two overside drains constructed, and streambank erosion repair were completed on Barker Creek with residents cost-sharing on labor and heavy equipment work. Steve Madrone of RCAA gave an overview of the completed Apple Butter Project where 20 of 21 landowners were cooperators. The RCD/NRCS team also installed 5000' of exclusionary fencing on upper Salt Creek. Hayfork Basin flow measurement charts, including thermographs on Salt Creek, Hayfork Creek, Big Creek, Upper Carr Creek and Big Creek were distributed to the Committee

V. Participants & Cooperators

Following is a list of signatories to the Memorandum of Understanding (appendix A) that was developed by the Steering Committee. It should be noted that signing or refraining from signing the MOU does not confer a different status upon an individual or organization as regards participation in the CRMP. The MoU is a tool to encourage participation and an agreement as to the principles of the CRMP only. Nothing else should be inferred.

John Rapf	Steve Beck	Kathy Dudley	William Dudley
Marvin Stewart	Darrel Panter	Elvie Thayer	Mary Arey
Elaine Potter	Earl Martin	Patricia Martin	Karen Wilson
Terry Bennett	Richard Elliott	Family Water Alliance	County of Trinity
Trinity RCD	Nor-El-Muk Tribe	Wintu Tribe	CA Fish & Game
Six Rivers NF	NRCS	Farm Services Agency	**Shasta-Trinity NF**

South Fork Trinity River Conservation Projects Completed as of December 1995

FINAL DRAFT - FOR REVIEW ONLY

Landowner	Tributary	Type of Work	Fence (ft)	Pipe (ft)	Planted Area
Beck	Carr	Riparian/Water conserv/fence	3200	1,700'-12" CMP	2700
Bowker	Carr	Riparian			450
Owens	Carr	Streambank erosion/diversion			
Stewart	Carr	Riparian			90
Vielbig et al	Barker	Road and stream bank erosion			
Felch	Hayfork	Fence	1330		
Claborn	Rusch	Water conservation-pipe ditch		1,300'- 8" CMP	
Collard	Gates	Water conservation-pipe ditch		3,500'-6" PVC buried	
Bennett	Salt	Riparian			600
Dudley	Salt	Riparian/Fence	739		739
Garrison	Salt	Riparian			
Khoury	Salt	Riparian			100
King	Salt	Riparian			245
Martin	Salt	Riparian/Fence	250		250
Patrides	Salt	Riparian			1100
Potter	Salt	Riparian	0		250
Stengel	Salt	Riparian/Fence	5825		1900
Thayer	Salt	Riparian			200
Wikse	Salt	Riparian			200
McAlexander	Tule	Riparian/Water conserv	0	1,700'-10" & 1,500'-12"	100
Wilson, K.	Hayfork	Ditch erosion-hand labor			
Murrison	Big	Stream bank erosion/Diversion			
Parke	SFTR	Stream bank erosion			
Kane/Barr	Butter	Excavate crossing/rock base/4" base			
Kane/Barr	Butter	Rock & grade 1800' road/9 dips			
King	Butter	Rock & grade 450' road/3 dips			
Lemos	Butter	Rock & grade 500' road/5 dips			
Fairbanks	Butter	Rock & grade 350' road/4 dips			
Starr	Butter	Rock & grade 500' road/3 dips			
Starr	Butter	Excavate crossing/rock base/4" base			
Starr	Butter	Water break/closed road/mulched			
Kaufman	Butter	Rock & grade 1000' road/8 dips			
Mankins	Butter	Rock & grade 550' road/14 dips			
Hunt	Butter	Rock 7 grade 2050' road/10 dips			
County Road	Butter	Replace 3 culverts/rock ditches/open	inlet	**7,200' of road rocked**	
Garvin	Barker	Water Conservation			
Hubbard	Rattlesnake	Water quality			
Galleher	Hayfork	Water Conservation/Fencing/Forestry			
Rapf	Butter	Water Conservation-ditch			
Atwell	Barker	Water quality			
Decapua, J	Madden	Road erosion/maintenance			
Osier	Madden	Road erosion/maintenance			
Stowe	Salt	Riparian Habitat/streambank erosion			
TOTALS			**11344**	**9700**	**8924**

VI. Roles and Responsibilities of Agencies and Landowners

Early in the formation of the South Fork CRMP a subcommittee was established to define the roles and responsibiloities of the individual landowners and agencies involved with restoration of the South Fork Trinity River fish stocks. A series of tasks were identified that included everything from coordinating landowner contacts, meeting agendas and minutes, funding and facilitation to project inventory, planning, implementation, monitoring, and education and public relations.

It was agreed that the Trinity County Resources Conservation District provide lead agency status on private lands and the USDA Natural Resources Conservation Service on federal lands. Key staff in each agency were indentified and listed according to taks and skill.

Patrick Trman & Associates will provide overall administrative coordination, facilitation, funding development, and education/outreach. Pacific Watershed Associates provides overall technical support for project identification, planning and implenentation.

Other agencies and landowners involved with the SFCRMP provide peer review and analysis of project planning and implementation. These agencies include Shasta-Trinity and Six Rivers National Forests, US Fish & Wildlife Service, National Park Service, Farm Services Agency, CA Fish & Game, and

The above paragraphs replace the rest of Section VI.

CRMP TASKS	**LEAD PERSON / AGENCY**	**ASSISTANCE**
Coordinate Contacts	Carol Joroski/Tim Viel	PTA/Noreen Doyas
Landowner Contacts		
-Small landowners	Carol Joroski/Tim Viel	PTA/Noreen Doyas
-Industrial	Pacific Watershed Associates (PWA) Patrick Truman & Associates (PTA)	Noreen Doyas/Jim Spear
-Federal	PTA / Tim Viel	PWA
Agendas / Minutes	PTA	Elena Letton
Mailings	PTA	Elena Letton
Plan Development	PWA / PTA	Noreen Doyas
Meetings / Field Trips	PTA	Elena Letton/Noreen Doyas
Funding (ID & Pursue)	PTA / Noreen Doyas	NRCS
Project Selection & Direction	PWA	FWS/NRCS/DFG/FS
Facilitation	PTA	PWA / NRCS
Liaison	PTA	PWA / NRCS
Database Maintenance	Kelly Sheen	Noreen Doyas
Memorandum of Understanding	PTA	PWA
Coordinate Agency Involvement	PTA	PWA

Inventory of Potential Work

Liaison - CRMP Committee	RCD / NRCS	PTA / PWA
Presenting Information	RCD / NRCS	PTA / PWA
NOAA Proposal	PWA	PTA

Inventory Watershed Projects

Forestry Fuels Reduction	CDF / Kenneth Baldwin	TBRG/NRCS/USFS
Water Conservation/Quality	RCD / NRCS	NCRWQB / DFG
Fisheries	FWS / DFG	NRCS
Erosion - Roads	NRCS / PWA / RCD	TRRP / DFG

Planning - Projects

Plans	Rich Roberts	RCD / PWA
Designs	Rich Roberts	RCD / PWA
Materials	John Condon	NRCS
Agreements	Noreen Doyas	Carol Joroski/Tim Viel
Funds	Noreen Doyas/Zoe Murdock	NRCS
Contracting	Noreen Doyas/John Condon	NRCS
Review-Peer & Public	PTA / PWA	NRCS
CEQA / Permits	Colleen O'Sullivan	NEPA - NRCS

Implementation

Coordination	RCD	NRCS
Supervision of Crews	RCD	NRCS
Liaison w/SAG-LO-Planners	RCD	NRCS
Contracting	RCD	NRCS
Materials	RCD	NRCS
Documentation	RCD	NRCS

Monitoring

Funding	PTA / PWA	RCD / NRCS / TRRP
Upland Water Quality/Quantity	Noreen Doays	Carol Joroski/Tim Viel
Fisheries - Instream	RCD / DFG	NRCS/FS/WR&TC
Wildlife	DFG / FWS	Tim Viel
Liaison w/Info-Education	Randi Anderson	Americorp

Education /Information / PR

Tours	PTA	Randi Anderson
Newsrelease	PTA	PWA / Randi Anderson
AAW	Jesse Miller	Randi Anderson
Schools	Jesse Miller	RCD / NRCS
Newsletter	PTA	Randi Anderson
Professional Articles	PWA / NRCS	RCD
Group Presentations	PTA / PWA	RCD / NRCS

VII. Ground Rules for Cooperation and Coordination

The South Fork Trinity River CRMP Steering Committee is a public participation forum with no formal membership requirements. The Committee generally makes decisions by consensus. Respect for other viewpoints is called for with a strong emphasis on cooperation while personal attacks are not tolerated.

VIII. Resource Management Issues

There are a host of resource management concerns among South Fork Trinity River (SFTR) residents and the various resource user groups in the watershed. In many instances, activities conducted by one portion of the public/private sector are in direct conflict with the interests of others. Conversely, whether you have any interest in recovering a healthy, stable, self-sustaining anadromous fishery in the basin, the following list is a variety of issues that need to be cooperatively addressed to encourage and achieve economic diversification, sustainability and future economic development in the watershed.

Restoring self-sustaining and economically valuable runs of anadromous fish populations to the SFTR should not be viewed as an end to other types of land use activities in the basin. Compromise and scientifically defensible, practical modifications in all of our land management activities, by all user groups, will reduce the influence all activities have on the ability of the SFTR to support a healthy fishery. Implementing feasible modifications to current land management practices could frequently provide for a net economic benefit to landowners, as well as reduce some of the recognized limiting factors currently preventing fisheries recovery.

Resource management issues which affect the SFTR can be divided into three general areas for compromise and resolution. The first area involves the land use activities that are contributing to fisheries and water quality problems, and are the issues which can be most readily addressed and solved by cooperators in the CRMP process (Subject Area #1 below). The second area involves larger issues which are, at least partly, the consequences of past management decisions and actions within the watershed and outside the basin. These Area #2 issues (see below) are more complicated issues to resolve, but are listed because they play a role in eventual fisheries and economic recovery. However, the influence of these issues on fisheries and economies can be reduced by actively pursuing cooperative efforts to address the issues listed in Area #1. The third area (Area #3 below) involves big picture, socio-political issues, which the CRMP group should work for consensus upon, but should not be the emphasis of CRMP planning and action. There are other issues, but this list summarizes the major issues expressed by the communities and agency personnel involved in the CRMP process in relation to the SFTR watershed.

A. Area #1 issues related to land use practices:

1. Sediment production and yield from forest and ranch roads
2. Sediment production and yield from other land use activities
3. Overgrazing in riparian zones
4. Loss of agricultural land due to streambank erosion
5. Improving efficiency of water use and decreasing critical period withdrawals

6. Quality and quantity of farming, industrial and residential return flows

B. Area #2 issues (consequences):

1. Depleted fish stocks
2. Economic and community stability
3. Degradation of fish and wildlife habitat
4. Lost or degraded riparian vegetation
5. Degradation of water quality
6. Forest fuel loads management

C. Area #3 issues (socio-political):

1. Access to public and private land and landowner rights
2. Public involvement in various land management issues
3. Environmental awareness and education
4. Determining the appropriate recreational levels for different parts of the watershed
5. Where and to what degree should aesthetics influence management decisions
6. Scientific knowledge needed to implement sound corrective measures and improvements
7. Securing sufficient implementation funding

IX. Prioritization Strategy

In the event landowner requests for assistance to address specific resource management issues exceeds the availability of funding or technical assistance personnel, a mechanism must be in place to prioritize where efforts and limited resources are expended first. Likewise, a prioritization strategy is needed to determine which portions or sub-basins in the SFTR contain critical fisheries habitat, and/or offer a higher probability of successfully implementing projects which can contribute to fisheries recovery efforts.

A. Types of project prioritization

Resource management issues which will initially be emphasized by the CRMP group to foster fisheries recovery and economic development in the SFTR are projects which:

1. improve water quality and water quantity,
2. reduce ongoing and potential erosion and sediment yield from roads and hillslopes, and
3. provide for streamside riparian protection and improvements.

The CRMP group has chosen to initially pursue these issues for several reasons. First, there is a high likelihood of seeing and measuring improvements in the stream ecosystem conditions if the CRMP is successful in gaining cooperation, participation, coordination and commitment from a majority of SFTR landowners. Second, there is presently a high amount of technical expertise available to the CRMP group and landowners to address these issues. Third, a moderately good number of funding sources are currently available to landowners to address these three issues. Fourth, the changes required in current land use practices by landowners in order to improve in-stream habitat conditions are not severe. Through continued education and communication, most landowners will realize that the changes being proposed to them by the CRMP are economically sound, while allowing each of them to do their part toward fisheries recovery in the SFTR.

Although the CRMP group initially intends to focus its efforts on addressing the three issues listed above, it will continue to serve as a vehicle for education, coordination and participation for landowners who reside in the SFTR, as well as agencies with land and resource management responsibility, to work toward gaining consensus on other resource management issues which may be affecting the economic and environmental health of the SFTR watershed.

B. Area or sub-basin prioritization

The SFTR watershed has historically supported large native populations of three stocks of salmonids. They are spring chinook salmon, winter steelhead and fall chinook salmon. Each species enters the watershed at different times during the year, and while there is some overlap, each utilizes different portions of the SFTR watershed as adult rearing and spawning and juvenile rearing habitat. In order to visualize and discuss the general areas of use by the different salmonid stocks, the CRMP divided the SFTR watershed into six (6) fish resource management units. Each unit contains a portion of the main stem of either the South Fork or of Hayfork Creek, as well as all the tributary streams and hillslopes which drain to the reach of main stem in the management unit (Appendix B).

The six fish resource management units adopted by the CRMP in the SFTR watershed are:

1) Lower South Fork (LSF)- Mouth to town of Hyampom
2) Middle South Fork (MSF)- Hyampom to town of Forest Glen
3) Upper South Fork (USF)- Forest Glen to Headwaters
4) Lower Hayfork Creek (LHFC)- Hyampom to Little Creek
5) Middle Hayfork Creek (MHFC)- Little Creek to Carr Creek
6) Upper Hayfork Creek (UHFC)- Carr Creek to Headwaters

At the present time, some portions of the SFTR watershed contain better fisheries habitat and watershed conditions than others, and some portions possess higher potential than others to benefit from directing CRMP activities in the areas. To better understand these linkages, and direct where CRMP sponsored projects will have their greatest benefits to salmonids, the CRMP group has developed a set of criteria to rank the six fish resource management units in terms of existing and potential values.

The ranking will also assist in prioritizing CRMP group responses to landowner requests for assistance, and will serve to identify land areas in the SFTR where outreach to landowners is most crucial. The four criteria used by the CRMP allow us to characterize watershed conditions in the SFTR as the wild salmonids in the basin might view them. Details of each of these criteria, as they reflect watershed conditions in each of the six fish resource management units, will be discussed in the implementation strategy section of the plan (section 10). The criteria are:

A. The presence and extent of "refugia" habitat.

"Refugia" is defined as either high quality and relatively self-functioning and/or undisturbed aquatic habitat, or formerly impacted stream habitats that are showing physical and biological indication that recovery to high quality habitat is occurring. In any watershed, "refugia" should be viewed as the best of the remaining habitat.

B. The extent of high quality riparian settings and water quality areas.
This criteria rates the degree to which main stem and tributary streams contain mixed over- and under-story stands of vegetation, and provide cool and nutrient rich waters, as well as low amounts of pollutants, including sediment, to the management unit. Each of these characteristics strongly influences the ability of the streams in the reach to support stable populations of native salmonids.

C. The presence or absence of a salmonid stock at risk of extinction.
This criteria is a measure of the importance of the fish management unit in providing preferred habitat which will support a particular stock of salmonid. As mentioned earlier, different fish stocks prefer to utilize different portions of the watershed. This criteria identifies the most significant or indicator stock of salmonid which historically used the management unit and what is its current risk of extinction throughout the Klamath and Trinity River watershed. The indicator stocks for each management unit are:

#1. (LSF):	Coho salmon and fall chinook salmon
#2. (MSF):	Spring chinook salmon and summer steelhead
#3. (USF):	Spring chinook salmon and summer steelhead
#4. (LHFC):	Spring chinook salmon and summer steelhead
#5. (MHFC):	Fall chinook salmon
#6. (UHFC):	Winter steelhead

D. Restoration potential. This includes the restoration potential of the main stem, its tributary streams (or both) in each of the management units. The potential is measured in terms of the CRMP's ability to realize, with a majority of landowners' cooperation, a net improvement in aquatic and ecosystem health, and in terms of the likelihood of implementing effective and cost-effective modifications to current land use practices.

Each fish management unit was evaluated as to how it ranks in relation to each criteria. Where the criteria was significant, it was given a high rating of five (5), a moderate rating equaled three (3), and a low rating equaled one (1). Table 1 presents the results of integrating the best available data on watershed and fisheries conditions for each of the CRMP-defined fish management units within the SFTR watershed.

Table 1. Prioritization for treatment of fish management units within the South Fork Trinity River watershed.

	Criteria				**Rating**
Reach	A	B	C	D	High=5, Low = 1

	Refugia	Water Quality	Stocks-at-risk	Restoration Potential	
1)LSF	M/L	M	M	M/L	10
2)MSF	H	M/H	H	M	17
3)USF	H	H	H	H	20
4)LHFC	M/H	H	M	M/H	16
5)MHFC	M	M	L	H	12
6)UHFC	M/L	H	L	M/H	12

Criteria established by the South Fork Trinity River CRMP indicate that the highest overall priority protection and restoration area in the South Fork is the Upper South Fork, followed by Middle South Fork and Lower Hayfork Creek. Although the Middle and Upper Hayfork Creek and Lower South Fork areas have lower priorities, several South Fork tributary sub-basins do have unique watershed and fisheries values. As a result, these sub-basins are important exceptions to the area prioritization and should receive focused attention if South Fork fisheries recovery efforts are to be successful. These sub-basins include:

Sub-basin	Unique value(s)
Madden Creek	based on coho salmon use, Tswnungwe tribal values and water quality value.
Eltapom Creek	high steelhead utilization and water quality value,
East Fork Hayfork Creek	high steelhead utilization
Big Creek	high steelhead utilization and high water quality value above major stream diversions

These important exception streams will be discussed in more detail in the following section.

X. Implementation Plan for the Six Resource Management Units of the SFTR watershed.

A. Management Unit #1: Lower South Fork below Hyampom

Management unit #1 includes the lower 29 miles of SFTR and the adjacent hillslopes and tributary sub-basins. Four prominent tributaries with drainage areas larger than $10mi^2$ drain into this reach of the management unit. They are Madden Creek, Grouse Creek, Eltapom Creek and Pelletreau Creek, with Grouse Creek ($59mi^2$) being the largest tributary stream in the $960mi^2$ watershed. Numerous other small, ($<5mi_2$) steep gradient tributary streams drain into the reach of the management unit. The main stem receives some protection by its Congressional and State designation as a Wild and Scenic River.

It is estimated approximately 25% of the land area within management unit #1 is privately owned, with the remainder being managed for multiple use by either Six Rivers or Shasta-Trinity National Forests. Smaller private landowners are concentrated along the main stem South Fork downstream of Mingo Creek and in the vicinity of Hyampom. Approximately 75% of the private lands are being managed for timber production by industrial landowners. Management unit #1 contains the highest percentage of private, industrial timber landowners. Private timber lands are concentrated in the area from Grouse Creek south to Pelletreau Creek, with the majority of lands in Pelletreau being private.

The prioritization of management units within the basin indicates the lower South Fork is the lowest priority area for directing CRMP activities in order to restore a stable and healthy fishery in the SFTR watershed (table 1). Part of this low rating for restoration potential is a result of it being the most downstream portion of the basin.

As a result of its location, it receives all the cumulative watershed effects, both natural and land use related, which have occurred in the watershed. Although the recovery of moderately good habitat conditions in the main stem and in Grouse Creek may take many decades to occur, the remaining tributaries, especially Madden and Eltapom Creeks, have significant potential to benefit from CRMP sponsored restoration and protection efforts.

1. Role of unit #1 in fisheries recovery

With the exception of coho salmon, the lower SFTR watershed and its tributaries are used far more extensively for rearing juvenile chinook salmon and steelhead than as spawning habitat. Major natural barriers and/or landslides in the tributary streams limit the amount of tributary habitat available to adults for spawning. With the exception of Grouse, Madden, Ammon, Mingo and Eltapom Creeks, each with approximately 1 to 1.6 miles of available spawning habitat, the remaining streams currently provide very limited amounts of suitable spawning habitat. Winter steelhead and fall chinook are the dominant species spawning in reach #1 tributaries. However, the extent of utilization is very small when compared to the remainder of the SFTR watershed.

The exception is coho salmon, which historically have utilized mainly the lower South Fork below Hyampom, and its larger tributaries, for both spawning and rearing. Little is known about past coho populations in the South Fork, but most researchers and local residents agree the run size was never very large.

Historically, the main stem South Fork below Grouse Creek has largely served as a migration corridor or holding area, in large pools, for adult salmonids. Some spring and fall chinook and winter steelhead spawning occurs between Grouse Creek and Hyampom, but in any given year, this is a very small percent of the total run size.

Prior to the 1964 storm and the accumulation of tremendous amounts of sediment in the lower South Fork, the reach supported large numbers of juvenile salmonids, of all age classes, and provided holding habitat for adult salmon. Currently, the main stem habitats are of poor quality and they support very low densities of both juvenile and adult fish (see limiting factor discussion below). What fish it does support are usually concentrated just below the confluence of colder tributary streams or in some of the deeper remaining pools. However, with the exception of Grouse Creek, lower South Fork tributary streams contain relatively high quality rearing habitat which is primarily used by juvenile steelhead and, to a lesser degree, chinook salmon juveniles. Eltapom Creek consistently has the highest densities of juvenile steelhead within any tributary stream throughout the SFTR watershed.

With the exception of Grouse Creek, most tributary streams have fairly low fine sediment concentration which suggest erosional processes within the basin are not seriously altered or are recovering from natural or past land use disturbances.

In addition, most tributaries have closed riparian canopies which contributes to high litter and food production and serves to keep water temperatures cool, both of which are desired by fish. It is very possible that some down-river migrating juvenile fish move into the tributary streams to avoid the generally lethal conditions in the main stem South Fork during the hot summer months.

2. Limiting factors to fisheries recovery and restoration potential

Main stem habitats in the lower South Fork will continue to be affected by elevated water temperatures and excessively high rates of sediment transport from the remainder of the SFTR watershed. This, coupled with probably the highest rates of sediment production from any one tributary stream, (Grouse Creek), and several major streamside landslides within the lower South Fork will continue to limit the ability of the main stem to support a viable population of salmonids. High amounts of stored sediment and high rates of sediment transport result in frequent channel changes, as well as the loss or the inability to establish suitable riparian vegetation and deep pool habitats which contributes to high water temperatures.

The restoration potential will remain low within the lower main stem South Fork until accelerated sediment sources within tributary streams and the remainder of the SFTR watershed are shut off, and efforts at reducing the temperature of water entering the reach are successful. As a result, temperature problems in the lower South Fork will continue to be a bottleneck to juvenile salmonid production in the SFTR watershed.

Within tributary streams of the lower South Fork, excluding Grouse Creek, habitat conditions are generally good. The streams do not contain high amounts of fine sediment, which reduces the quality of fish habitat, nor do the streams have high water temperature problems. The major threat to the tributary streams is future accelerated erosion and sediment production from the

hillslopes within each tributary basin. High rates of sediment production will not only reduce the quality of the tributary habitats, but also continue to exacerbate conditions in the main stem.

Habitat inventories conducted in a number of lower South Fork tributaries indicate most streams are low in the amount of pool habitats which can serve as rearing habitat for juvenile salmonids. These same surveys suggest that a lack of spawning gravel in Madden Creek may also be limiting salmonid production. There is a high potential to implement beneficial fisheries and watershed projects in lower South Fork tributaries.

3. Anticipated future multiple land use

The most likely future land uses to occur in the lower South Fork watershed are associated with timber harvesting. These include new road construction, road reconstruction and the harvesting of timber. Six Rivers National Forest (SRNF) has recently completed a watershed analysis for the Grouse Creek basin and is scheduling the Madden Creek watershed and the other lower South Fork tributaries for analysis in 1996. It is expected that a combination of timber harvesting and erosion control projects will be an outcome of the analyses.

It is probable that minimal new road construction would occur with future timber harvesting, and that in fact, there will probably be a net decrease in total road mileage as a result of some level of road decommissioning. At the present time, Shasta-Trinity National Forest (STNF) has no plans for scheduling watershed analysis on its lands within the lower South Fork.

The CRMP group should expect moderate levels of road construction, road reconstruction, timber harvesting and proper hydrologic road closure from private lands within the lower South Fork.

SRNF has been inventorying roads for industrial landowners in Grouse Creek. Sierra-Pacific Timber Company has been upgrading portions of its road system in Grouse Creek. Simpson Timber Company has recently completed a roads inventory on 5mi^2 of its lands in the Pelletreau Creek basin.

PG&E recently offered to sell three separate parcels of land adjacent the main stem and within the wild and scenic corridor. It is possible these will be purchased by a small industrial landowner and be used for timber harvesting in the future.

Use of the lower South Fork river by hikers and rafters is likely to continue to increase through time.

4. Proposed watershed and fisheries action items to achieve fisheries restoration

The following prioritized list of actions should be pursued by the CRMP group in order to protect and improve the existing higher quality fisheries habitats in tributary streams and begin to improve main stem habitats.

a) The highest priority activity in management unit #1 should be to inventory the watershed's hillslopes for potential sediment sources, and based on the results, begin implementing technically sound, erosion prevention activities along roads in the lower South Fork. The most important tributaries to perform "storm-proofing" activities are first Eltapom and Madden Creeks followed by Ammon and Mingo Creeks.

b) The CRMP should actively cultivate communication and cooperation with industrial and smaller landowners to secure a commitment to reduce or minimize the risk of significant, land use caused sediment production in any of the lower South Fork tributaries during future storms.

c) Many lower South Fork tributaries offer good water quality conditions for juvenile salmonids. However, there is a possibility the streams could support more juveniles if greater amounts of high quality rearing habitat was available. The CRMP should conduct the necessary field inventories to determine whether or not some form of habitat manipulation could increase the carrying capacity of lower South Fork tributary streams to host more fish. The highest priority streams to conduct the inventories and possibly modify habitat are: Madden, Ammon, Mingo, Underwood, Surprise and possibly Pelletreau Creeks.

The first 5 are listed because they currently support juveniles salmonids, and the latter because considerable channel recovery may have occurred in the middle portion of Pelletreau. Because of the currently high densities of juveniles utilizing Eltapom Creek, no manipulation of in-stream habitat need be contemplated.

d) Some lower main stem tributary streams may be serving as cold water refugia for juvenile rearing and main stem down-migrants attempting to escape the lethal temperatures in the lower main stem. There may be a possibility other tributary streams could serve as refugia if juveniles or adults had access to them. The CRMP should undertake inventories of the configuration of all lower main stem and tributary stream mouths to determine if any are amenable to some form of modification.

e) Many juvenile salmonids may be dying in any given year in the lower main stem of the South Fork due to high water temperatures. The CRMP should coordinate the initiation of a volunteer spring and summer rescue program for juvenile salmonids. Permits from DFG will need to be obtained for rescue efforts. Training in proper fish handling techniques should be provided to the volunteers. Rescued fish should be transported and placed in the nearest cold water creek from where they were rescued.

f) Riparian canopy conditions along the main stem and in tributaries should be assessed as to whether or not a re-vegetation effort, utilizing a mix of conifer and deciduous species, could begin to have any effects on the temperature problems in the main stem South Fork. Likewise, streamside landslides through out the lower South Fork should be assessed as to whether an intense re-vegetation effort would begin to increase the slope stability. SRNF has done a fair amount of these types of planting over the last several years, but there may be other locations where the approach could be beneficial.

B. Management Unit #2: Middle South Fork between Hyampom and Forest Glen

Management Unit #2 includes the middle 24 miles of the main stem SFTR and the adjacent hillslopes and tributary sub-basins between the towns of Hyampom and Forest Glen. There are only two major tributary streams with drainage areas greater than 30mi^2. Both Butter Creek, with its major tributary of Indian Valley Creek, and the Plummer Creek sub-basin drain from the east into the middle South Fork. There are approximately three dozen other small (<5mi^2), steep gradient tributary streams draining into the middle South Fork reach. During the 1964 storm, most of the small watersheds on South Fork Mountain between Plummer Creek and Pelletreau Creek experienced severe erosion as a result of historic land use activities. During 1987, major wildfires burned approximately 75% of the land base to the east of the South Fork main stem. The main stem is designated as a Wild and Scenic River.

It is estimated approximately 10-12% of the land area within management unit #2 is privately owned, with the remaining lands being managed for multiple use by Shasta-Trinity National Forest (STNF). Most smaller private landowners are scattered throughout the management unit either adjacent the main stem South Fork or in lower Butter Creek and upper Indian Valley Creek. Approximately 70% of the private lands are being managed for timber production. Private timber lands are concentrated throughout the Plummer Creek watershed, and along South Fork Mountain between Plummer Creek and the Pelletreau Creek watershed.

The CRMP prioritization strategy (Table 1) indicates the middle South Fork management unit is the second most important area to concentrate and pursue CRMP activities in order to restore a stable and healthy fishery in the SFTR watershed. The high prioritization of the middle South Fork is largely a result of the importance of the reach in recovering a sustainable spring chinook salmon fishery. An improved spring chinook fishery in the middle South Fork reach is tied very closely to watershed improvements that can be successfully implemented in management unit #3, the upper South Fork Trinity River.

1. Role of unit #2 in fisheries recovery

The middle South Fork main stem has historically, both before and since the 1964 storm, been the most heavily used reach of stream by chinook salmon in the whole SFTR watershed. The large number of deep pools in the reach provide summer holding and rearing habitat for adult spring chinook, as well as some summer steelhead and juvenile salmon and steelhead. During the fall months, spring chinook and summer steelhead also utilize the middle South Fork reach for spawning more than in any other reach of the SFTR watershed. By all accounts, summer steelhead populations in the SFTR watershed have never been very significant. Prior to the 1964 storm, most biologists and many long time residents to the South Fork believe that spring chinook were the largest population of salmon in the SFTR watershed. The preservation of existing runs and the increase of stable spring chinook populations will ultimately be one of the major measures of success of the fishery recovery efforts in the SFTR watershed.

The only other species of salmonid to currently utilize the middle South Fork and its tributaries in large numbers is winter steelhead. Some main stem spawning occurs during drought years, however most steelhead spawning takes place in the tributary streams, most notably in Butter Creek and Plummer Creek. The middle South Fork management unit plays a relatively minor role

in maintaining steelhead populations throughout the SFTR watershed. Prior to the 1964 storm, coho and chinook salmon were present in Butter Creek, but none have been observed in the sub-basin over the last several decades.

With the exception of several South Fork Mountain tributary streams, most tributary streams draining into the middle reach have closed riparian canopies and provide generally cool water to the main stem. However, available information indicates most tributaries, except for Butter Creek, contain fairly high sand-sized particle concentrations. This suggests high rates of erosion are occurring in a number of the tributary sub-basins. Surveys conducted in Plummer Creek noted frequent streamside landslides and high levels of fine sediment in spawning gravels. In spite of these sediment problems, the cold waters in both Butter and Plummer Creeks rear moderately high numbers of juvenile steelhead, of all age classes. In addition, in 1990, Plummer Creek was the only South Fork tributary stream rearing a high number of juvenile chinook salmon. This suggests that improving the condition of tributary habitat in this reach can assist in spring chinook salmon recovery.

Little is known about watershed and channel conditions in the numerous small tributary sub-basins in this reach. It is likely most of the numerous <5mi^2 tributary streams draining the middle South Fork reach provide limited amounts of spawning and rearing habitat. However, these streams can be important contributors to spring chinook salmon recovery if they deliver cold water and low quantities of sediment to the main stem.

2. Limiting factors to fisheries recovery and restoration potential

Recovering the pre-1964 pool size and frequency, the flushing of high amounts of presently stored sediment and fine sediment from spawning gravels, and the prevention of high rates of future erosion and sediment yield from both the middle and upper South Fork watershed are the keys to spring chinook recovery.

There is general agreement that main stem and tributary habitat conditions have been improving in the middle South Fork reach. Moderately high streamflow over the last couple of years, coupled with a lack of obvious major sources of erosion and sediment yield from the watershed, is allowing the pools within the middle South Fork main stem to gradually enlarge and deepen. However, main stem habitats have not recovered to the condition and quality that existed prior to the 1964 storm. In any year, depending on extent of winter and spring storms, problems with elevated summer water temperatures can occur which will reduce the carrying capacity of the middle South Fork to support increased numbers of spring chinook, and rear juveniles.

The reach currently stores high amounts of sediment and experiences high rates of sediment transport. As a result, main stem spawning gravels are of poor quality, with high concentrations of fine sediment, and subject to frequent stream bed scouring which limits the likelihood of successful spawning.

There is little that can be done to physically remove stored sediments and to increase pool size in the middle South Fork main stem. Moderate to large storms need to occur over the next decade, and action to reduce future erosion from the hillslopes and tributary sub-basins are both needed to continue improving middle South Fork spawning and rearing habitats.

Available data on middle South Fork tributaries suggests most streams are presently good sources of cool water to the main stem, having closed riparian canopies, but that many may be transporting moderate to high quantities of sediment. Portions of most sub-basins have been intensively managed and disturbed by past roading and timber harvesting practices. It appears that some measure of natural recovery from these past disturbances has occurred. However, high rates of future sediment production within sub-basins will limit the ability of the streams to contain high quality spawning and rearing habitat. Loss of riparian vegetation associated with future high sediment transport rates may also reduce the quality of water in tributary streams, and hinder main stem temperature and pool recovery.

The ability of middle South Fork tributary streams to support additional adult salmonids appears to be limited by the quantity of available spawning gravel, which is judged to be low in both Butter and Plummer Creeks. However, given the relatively high densities of juvenile salmonids utilizing these streams, compared to most other South Fork tributaries, efforts to increase the amount of spawning habitat are not recommended at this time.

The extensive fires throughout most eastside sub-basins in 1987 poses an unknown but probable high risk of, at a minimum, accelerating fine sediment contributions to eastside streams. These risks have been diminishing over the past 8 years, but erosional impacts and loss of riparian vegetation may be having some role in limiting fisheries recovery.

3. Anticipated future multiple use

Timber harvesting has been traditionally the primary land use activity in the middle South Fork (management unit #2) by both STNF and on private lands. Following the wild fires in 1987, sizeable portions of the Butter Creek watershed in Indian Valley were salvage logged. However, over the last decade, rates of road construction and timber harvesting on South Fork Mountain have been relatively low and activities have been concentrated on the private timberlands.

At the present time, it is difficult to predict the level of forest management on industrial and smaller private timberlands. However, it is expected that a significant increase in forest management activities, including road construction, road upgrading, road decommissioning, timber harvesting and forest fuels reduction, will be occurring in the middle South Fork on mainly public lands over the next decade. STNF has already begun implementing its fuel management program in the Butter Creek watershed. The Plummer Creek watershed is scheduled for watershed analysis by STNF in 1997, which will likely lead to increased levels of forest management. Much of the middle South Fork land area is included in the Hayfork Adaptive Management Area. Researchers with the USFS are considering a proposal to experiment with a variety of different silvicultural (harvesting) methods to test timber harvesting effects on the Northern Spotted Owl.

4. Proposed watershed and fisheries action items to achieve fisheries restoration

The following prioritized list of actions should be pursued by the CRMP group in order to protect and improve the existing, higher quality fisheries habitats of selected tributaries and to continue to improve main stem habitats.

a) The highest priority activity in management unit #2 should be to inventory the watershed's hillslopes for potential sediment sources and, based on the results, begin implementing technically sound, erosion prevention activities along roads in the middle South Fork. The most important tributaries to perform "storm-proofing" activities are first Plummer and Butter Creeks followed by all the smaller tributary creeks draining off South Fork Mountain. Many South Fork Mountain tributaries have a history of producing high amounts of sediment associated with past management activities. Erosional products are usually transported very rapidly to the main stem South Fork. Preventing erosion before it occurs will be an important element in improving the quality of main stem habitats for spring chinook and winter steelhead.

b) The CRMP should actively cultivate communication, cooperation, and education with industrial and smaller landowners to secure a commitment to reduce or minimize the risk of significant, land use caused sediment production in any of the middle South Fork tributaries during future storms. Landowners in Plummer, Hitchcock and Sulphur Glade Creeks should be contacted and encouraged to participate.

c) Riparian canopy conditions along the main stem and in tributaries should be assessed as to whether or not a re-vegetation effort, utilizing a mix of conifer and deciduous species, could begin to have any effects on the temperature problems in the main stem South Fork. Likewise, streamside landslides through out the middle South Fork basin should be assessed as to whether an intense re-vegetation effort would begin to increase the slope stability and reduce heating of surface waters.

d) Some middle main stem tributary streams may be serving as cold water refugia for juvenile rearing and main stem down-migrants attempting to escape the warm water temperatures in the middle main stem. There may be other tributary streams that could serve as summer refugia if juveniles or adults had access to them.

The CRMP should undertake or encourage inventories of the configuration of all middle main stem and tributary stream mouths to determine if any are amenable to some form of beneficial modification.

C. Management Unit #3: Upper South Fork between Forest Glen and the Headwaters

Management unit #3 includes the upper approximately 28 miles of the SFTR and the adjacent hillslopes and tributary sub-basins. There are three prominent tributaries with drainage areas larger than $20mi^2$ draining into the upper South Fork main stem. They are Rattlesnake Creek, Smoky Creek and the East Fork South Fork Trinity River. There are another seven tributaries with approximately $5mi^2$ to $7mi^2$ watershed areas. These are Cable, Silver, Rough Gulch, Happy Camp, Red Mountain, Bierce and Shell Mountain Creeks. Finally, there are a large number of small ($<3mi^2$), steep gradient tributary streams which drain into the upper South Fork.

It is estimated only about 2% of the land area within management unit #3 is privately owned. The private lands range from 40 acre to 1.5mi^2 parcels, and are scattered throughout the upper South Fork either along the main stem as residential properties or primarily on South Fork Mountain, most of which are managed for timber production. Commercial timber from most of the private timberlands has been harvested over the last 30 to 40 years. The remainder of the upper South Fork has largely been managed by STNF for timber production, recreation and some livestock grazing, or as designated wilderness. Levels of STNF forest management were very high in the 1950's through 1980's, particularly within all the eastside sub-basins of the upper main stem South Fork. The result is some of the highest road densities throughout the entire SFTR watershed being present within the East Fork, Smoky and in the Rattlesnake Creek sub-basins.

Portions of two tributaries to Rattlesnake Creek, Flume Creek and North Rattlesnake Creek, were extensively burned in 1987, and a 20mi^2 area of the headwaters of the South Fork above Shell Mountain Creek was severely burned in 1988. Some salvage logging occurred in both areas, and the areas were heavily treated for erosion control by the USFS.

The CRMP prioritization strategy (Table 1) indicates the upper South Fork management unit is the most important area to concentrate and pursue CRMP activities in order to restore a stable and healthy fishery in the SFTR watershed. The high prioritization of the upper South Fork is largely a result of several factors.

First, the upper reach contains the headwaters portion of the SFTR watershed and is therefore not being influenced by a large upstream watershed area which cumulatively impact the reach. Second, the upper South Fork main stem has over 20 miles of salmon and steelhead habitat and approximately 10 miles of tributary stream habitat available to adult salmonids, much of which is showing indications of gradually improving in-river and watershed conditions. Third, addressing existing and potential limiting factors to fisheries recovery should be technically less complicated, since the CRMP group is mainly dealing with only one land manager, the USFS, who is required to implement the President Clinton's Forest Plan (Record of Decision), including the Aquatic Conservation Strategy elements related to fisheries recovery of the Plan.

1. Role of management unit #3 in fisheries recovery

The rapid improvement of habitat conditions in the upper South Fork main stem below the East Fork has the potential to ensure viable spawning and rearing habitat is available to spring chinook and the limited summer steelhead stocks while channel conditions continue to improve in the middle South Fork main stem reach. Historically and presently, the upper South Fork has not been as high a producer of spring chinook salmon as management unit #2 (middle South Fork). However, the upper South Fork has experienced a greater degree of channel recovery to pre-1964 conditions than management unit #2.

Prior to the 1964 storm, adult and juvenile spring chinook salmon utilized the East Fork for both spawning and rearing. Adult spawning surveys consistently indicate the East Fork is one of the preferred streams utilized by steelhead in the SFTR watershed. It is felt CRMP-directed efforts toward fisheries recovery in the SFTR watershed can have the greatest, and possible most immediate, influence in the upper South Fork management unit.

Over the last four years, on average approximately 25% of the adult spring chinook and summer steelhead population has utilized the upper South Fork for summer rearing and fall spawning. Upper South Fork main stem runs and pools have continued to enlarge and deepen during the last several better-than-average water years. This scouring is improving the quality of both rearing and holding habitats for adult and juvenile salmonids. Considerable flushing of previously introduced channel-stored sediment has occurred, yet the upper South Fork still experiences quite high concentrations of fine sediment. In spite of this, in some water years, the upper South Fork main stem above Forest Glen supports some of the higher densities of juvenile salmonids of any main stem reaches of stream in the SFTR watershed.

Winter steelhead are the only other species of salmonids utilizing both the upper main stem and some portion of virtually every accessible tributary stream. With the exception of habitat surveys which have been conducted in the East Fork and Rattlesnake Creeks, little is known about the quality of habitat in the many other smaller tributaries which could be serving as individually small, but collectively significant, contributors to steelhead production in the upper South Fork. Data from the East Fork suggests fine sediment concentrations are very high and this could reflect high rates of annual erosion and sediment yield being delivered from the extensive road network in the East Fork. Rattlesnake Creek habitat data suggests fairly low concentrations of fine sediment and fairly abundant higher quality rearing habitat.

Portions of the Rattlesnake Creek sub-basin have experienced moderately high levels of in-stream habitat manipulation over the last decade. However, in both sub-basins fish densities are low compared to many other SFTR sub-basins, but still higher than most main stem habitats of both the South Fork and Hayfork Creek.

Stream flows emanating from the East Fork, Rattlesnake and Smoky Creeks sub-basins are providing generally good water quality and cool temperatures to the upper main stem. This suggests that riparian canopy conditions are reasonably good along these tributary streams. However, channel surveys conducted in Rattlesnake and the East Fork indicate there is a fairly high frequency of continuing streambank erosion.

The main stem water temperature above Forest Glen frequently rises into the low 70's during some water years. The roughly north to south orientation of the upper South Fork probably contributes to the occurrence of higher water temperatures, but considerable widening of the main stem channel and openings in the riparian canopy occurred during the 1964 storm. It is possible there are lingering effects contributing to marginal water temperatures during some water years. Likewise, loss of streamside riparian vegetation due to the wild fires in 1987 and 1988 may also be contributing to marginal water temperatures.

2. Limiting factors to fisheries recovery and restoration potential

In terms of fisheries impacts associated with past erosion in the SFTR watershed and altered stream temperature regimes, the main stem of the upper South Fork was the least severely impacted of the three main stem South Fork management units. As a result, considerable channel recovery has already occurred and one could argue that habitat in the upper South Fork may be considered the best remaining main stem habitat in the watershed.

However, the two most significant limiting factors to recovering a stable and self sustaining spring chinook and winter steelhead fishery in the upper South Fork management unit are the continued and/or new, major influxes of sediment, and seasonally marginal temperature regimes in the main stem. Seasonal or catastrophic, (storm-related), erosion and sediment yield from the extensive road network, from some timber harvesting units, from streamside landslides either along the main stem or within the tributary sub-basins and from the burned areas all pose a risk of limiting the fisheries recovery. Reducing the risk of erosion and the delivery of sediment to stream channels, both large and small, will allow future higher streamflows to continue the stream habitat recovery that is occurring in the upper South Fork. With time, pools should continue to increase in size and depth, and spawning gravels should improve in quality as excessive amounts of fine sediment are transported out of the reach, both of which will increase the fish carrying capacity of the upper South Fork.

Catastrophic inputs of sediment during the 1964 storm may have significantly shifted the distribution of habitat types in many of the larger upper South Fork tributaries. For example, in the East Fork sub-basin, the changes in channel form may be so severe as to preclude the formation of deeper pools which could once again hold adult spring chinook in our lifetime.

However, efforts at reducing the rate of sediment production and to improve riparian canopy conditions and further reduce water temperatures will likely benefit most upper South Fork tributary streams in their ability to support increased numbers of spawning adults and rearing juveniles.

The upper South Fork main stem and tributary sub-basins offer the best potential for improving in-stream habitat and watershed conditions for the benefit of wild salmon and steelhead in the SFTR watershed. Few streams throughout the management unit appear to be storing major quantities of coarse sediment. Many of the problems are associated with high quantities of fine sediment, which is far easier to address (prevent or reduce) than high quantities of coarse sediment. Fine sediment is easily transported out of a reach of stream, once future sources of erosion and fine sediment production are shut off.

3. Anticipated future multiple land use

It is anticipated that future land use on private timberlands in the upper South Fork will be at fairly low activity levels. Most of the parcels have been extensively managed in the past. Several of the parcels, particularly those in Farley Creek, Charlton Creek, Bierce Creek and in the East Fork may offer opportunities for cooperation to either "storm-proof" or properly close some road segments until they are needed in the future.

Following the wild fires in 1987 and 1988, sizeable portions of the upper South Fork lands in the vicinity of Penny Ridge and in the Flume and North Rattlesnake Creek watersheds were salvage logged. However, over the last decade, rates of road construction and timber harvesting in the upper South Fork management unit have been relatively low compared to previous decades.

It is expected that a significant increase in forest management activities, including road construction, road upgrading, road decommissioning, timber harvesting and forest fuels reduction, will be occurring in the upper South Fork, mainly on public lands, over the next decade. STNF has already begun implementing portions of a fuels management program in the Smoky Creek and Red Mountain Creek watersheds. In 1995, STNF hydrologically closed or up-graded well over 25 miles of forest roads in the East Fork, Smoky Creek and Silver Creek area. The East Fork South Fork watershed is scheduled for watershed analysis by STNF in 1996, which will likely lead to increased levels of forest management and watershed restoration. A CRMP group sponsored inventory of potential future sediment sources in the East Fork watershed will be completed this summer, and this could lead to a high level of road repair or possibly proper road closure. Much of the upper South Fork land area is included in the Hayfork Adaptive Management Area. Researchers with the USFS are considering a proposal to experiment with a variety of different silvicultural (harvesting) methods to test timber harvesting effects on the Northern Spotted Owl.

4. Proposed watershed and fisheries action items to achieve fisheries restoration

The following prioritized list of actions should be pursued by the CRMP group in order to protect and improve the existing, tributary streams containing higher quality fisheries habitat and to continue to improve main stem habitats.

a) The highest priority activity in management unit #3 should be to inventory the watershed's hillslopes for potential sediment sources, and based on the results, begin implementing technically sound, erosion prevention activities along roads in the upper South Fork. The most important tributaries to perform "storm-proofing" activities are first the East Fork South Fork, Smoky Creek, Silver Creek, Red Mountain Creek and Rattlesnake Creek. Each of these tributary streams are considered to offer some degree of higher quality habitat for spawning and rearing salmonids. Erosion, which also continues to occur in each of these watersheds, poses a high potential to limit spring chinook and steelhead recovery in the watershed.

Next, road systems within the smaller tributary creeks and watersheds draining South Fork Mountain should be inventoried. The highest priority South Fork Mountain watersheds are first Happy Camp Creek and Shell Mountain Creek.

Both watersheds are nearly exclusively managed by STNF and there is very little data about channel conditions and past land use history. Both creeks may be serving as refugia habitat for steelhead. This effort should be followed by inventories in Bierce, Rough Gulch, Charlton and Farley Creeks. Each has a mix of past public and private land management and there may be a considerable amount of erosion prevention activities that could be performed.

Many South Fork Mountain tributaries have a history of producing high amounts of sediment associated with past management activities. Erosional products are usually transported very rapidly to the main stem South Fork. Preventing erosion before it occurs will be an important element in improving the quality of main stem habitats for spring

chinook and winter steelhead and protecting any existing high quality habitats in these watersheds.

b) The CRMP should actively cultivate communication, cooperation, and education with industrial and smaller landowners to secure a commitment to reduce or minimize the risk of significant, land use caused sediment production in any of the middle South Fork tributaries during future storms. It may be fairly easy to open a dialogue with upper South Fork private landowners.

c) Riparian canopy conditions along the main stem and in tributaries should be assessed as to whether or not a re-vegetation effort, utilizing a mix of conifer and deciduous species, could begin to have any beneficial effect on the temperature problems in the main stem South Fork. Likewise, streamside landslides throughout the upper South Fork basin should be assessed as to whether or not an intense re-vegetation effort would begin to increase slope stability and reduce heating of surface waters.

D. Management unit #4: Lower Hayfork Creek between Hyampom and Little Creek

Management Unit #4 includes the lower 18 miles of the main stem Hayfork Creek and the adjacent hillslopes and tributary sub-basins between the town of Hyampom and the mouth of Little Creek. Corral Creek is the only major tributary stream in lower Hayfork Creek with a drainage area greater than 30mi^2. The upper 60% of Corral Creek is located in a high plateau known as Corral Bottom, and is administratively located within the Big Bar Ranger District of STNF. Several tributary sub-basins feed water, nutrients and sediment into Corral Creek. These include East and West Hayshed Creeks and Hyampom Creek located within the Corral Bottoms portion of the watershed, and Gates Creek which flows into Corral Creek near the mouth of Corral Creek.

Other important tributary sub-basins in the lower Hayfork Creek management unit include: Miners Creek, an approximately 16mi^2 watershed, Bear Creek, an approximately 10mi^2 watershed and the Little Creek, Rusch Creek and Olsen Creek watersheds each with 6 to 8mi^2 drainage areas. Approximately a dozen other small, (<3mi^2) non-fish bearing tributary streams also drain into lower Hayfork Creek.

The lower Hayfork Creek management unit contains the informally designated "Pattison Roadless Area," the largest contiguous area of land with minimal to no roads, excluding designated wilderness, in the entire SFTR watershed. It includes most of the hillslopes and watersheds north of the main stem of lower Hayfork Creek from the small Bear Creek basin near Rays Peak upstream to and including the Little Creek sub-basin, and encompasses most of lower Corral Creek, Gates Creek, Miners Creek and the larger Bear Creek. The exception is the Corral Bottom area of upper Corral Creek where extensive past roading and timber harvesting has occurred.

Most streams draining the southern hillslopes to the main stem of Hayfork Creek are short and steep, are largely non-fish bearing, and excluding Rusch Creek, have experienced low to moderate rates of past roading and timber harvesting.

It is estimated approximately 5% of the land area within management unit #4 is privately owned, with the remaining lands being managed for multiple use by Shasta-Trinity National Forest (STNF). Approximately two-thirds of the private lands are concentrated in the Corral Bottom area of Corral Creek and are primarily managed for timber production and open range grazing. The remaining private lands are mainly located in lower Olsen Creek adjacent Hyampom, at the Bar 717 Ranch and near the mouth of Corral Creek. Most of these lands are utilized for either agriculture, recreation, as residential property or for timber production.

During 1987, major wildfires burned through the lower half of the Olsen Creek and Corral Creek watersheds, as well as the upper half of the Flat Creek watershed which flows through the Bar 717 Ranch. Following the fires, considerable salvage logging was performed in the Olsen and Flat Creek watersheds, but none was conducted in the Corral Creek burned areas.

The CRMP prioritization strategy (Table 1) indicates the lower Hayfork Creek management unit is the third most important area to concentrate and pursue CRMP activities in order to restore a stable and healthy fishery in the SFTR watershed.

However, in reality the role the reach can play in recovery is equivalent to management unit #2, the middle South Fork reach. The high prioritization of lower Hayfork Creek is largely a result of several factors. The reach generally has fair to good instream habitat in the main stem and several of the larger tributaries, and there are a significantly larger number of relative undisturbed and naturally functioning tributary sub-basins compared to the other 5 management units. These two characteristics contribute to a high potential for the reach to support larger populations of spring and fall chinook, as well as winter steelhead and coho salmon.

1. Role of reach #4 in fisheries recovery

In the 1950's and early 1960's, the lower main stem Hayfork Creek supported all four runs of adult salmonids known to utilize the SFTR watershed. However, most professionals and local residents agree that the reach and its tributary streams were most heavily used by adult winter steelhead and juveniles of all species. While winter steelhead may still be the dominant run of salmonids utilizing this reach of stream in the 1990's, surveys conducted in the SFTR watershed over the last 5 years indicate up to 5% of the adult spring chinook population and up to 35% of the summer steelhead population is still utilizing lower Hayfork Creek for both rearing and spawning. These fish are believed to be attracted to the lower Hayfork watershed because of the fair to good habitat which exists in portions of the lower Hayfork Creek reach.

While it is recognized that the main stem South Fork in management units #2 and #3 are the major historical areas for spring chinook and summer steelhead utilization, the continued use of lower Hayfork Creek by both these species of salmonids during the summer months suggests that improvements to the existing habitat could lead to increased utilization and numbers of adults. Likewise, any improvements in habitat for these species, will improve the available habitat for winter steelhead adults, fall chinook, possibly coho salmon and juveniles of all species.

With the exception of a short segment of lower Hayfork Creek near Hyampom, the remainder of the main stem reach is located in a deeply incised canyon. Unlike the main stem South Fork, the Hayfork Creek Watershed and most of its tributaries have historically never been subjected to severe amounts of major sediment deposition or channel aggradation. This, coupled with the accessibility of lower Hayfork Creek to all species and runs of salmonids within the SFTR watershed, especially in drought years, further supports the importance of lower Hayfork Creek to support a far larger population of both adult and juvenile salmonids.

The majority of factors affecting the ability of lower Hayfork Creek to support larger populations of salmonids do not originate within the lower Hayfork Creek management unit, but instead are associated with land use related impacts occurring in the middle and upper reaches of Hayfork Creek. These impacts are largely associated with land use practices which are affecting both the quantity and quality of water being delivered to lower Hayfork Creek.

Largely because of the low level of past land use in lower Hayfork Creek and many of its tributary sub-basins, riparian conditions along most stream reaches have not been significantly altered and are thought to be relatively good. Most tributary streams, and in particular the larger tributary sub-basins such as Little Creek, Rusch Creek, Bear Creek, Miners Creek, Corral Creek and Olsen Creek have either good riparian canopy closure, and/or deliver important quantities of cool water to the main stem.

While little is known about the quality and quantity of tributary spawning and rearing habitat, it is likely the reach is an important steelhead producer, especially during drought water years.

Juvenile steelhead densities are locally quite high in portions of the lower Hayfork Creek management unit, particularly in pool and run habitats at or just downstream from the confluence with the cold water tributary mouths. The presence of fresh water clams, crayfish and salamanders in fairly high numbers in portions of the main stem or in some tributaries throughout the lower Hayfork basin indicates water quality is not severely impacted, or else these aquatic species would not be present. All this information indicates moderately high quality watershed and channel conditions exist in portions of management unit #4, and supports the hypothesis that lower Hayfork Creek can be a significant contributor to the SFTR watershed fisheries recovery.

2. Limiting factors to fisheries recovery and restoration potential

The principal in-river limiting factors to improving the ability of the lower Hayfork Creek watershed to support increase numbers of adult and juvenile salmonids, for any species using the SFTR watershed, are: 1) most importantly, improving the quality and quantity of waters being delivered to the reach from the middle and upper Hayfork Creek basin, and 2) reducing fine sediment concentration from roads and managed areas both within the lower Hayfork Creek watershed, as well as from the upper and middle watershed. A third important factor is the continued protection of existing high quality watershed and water quality values within the lower watershed tributaries.

With the exception of winter steelhead, main stem environments throughout the SFTR watershed have historically played a far more important role in salmonid production and rearing than

tributary streams. For this reason, land use factors which have their greatest effect on the quality of main stem habitats to support wild populations of salmonids are particularly damaging.

The available data on the lower Hayfork Creek watershed suggests water temperatures are not optimal for salmonids during the summer months in many reaches of the main stem. Both adult and juvenile fish tend to selectively concentrate in cooler water, in deep pool habitats, at the confluence of tributary streams and in steeper riffles where waters contain higher levels of dissolved oxygen.

Within the best remaining, least altered stream habitats in the Trinity River and Klamath River watersheds, juvenile salmonids are documented to utilize all stream habitats, in equal proportions if habitat conditions are of good quality. With the low levels of past land use throughout the lower Hayfork Creek watershed, and the lack of information to suggest significant damage or loss of riparian vegetation due to past storms along the main stem or its tributary streams, temperature problems in the main stem do not appear largely related to changes which may have occurred within the management unit.

The major problem limiting fisheries recovery in lower Hayfork Creek is believed to be a consequence of the reach being at the downstream end of the Hayfork Creek watershed which will be discussed in the next management unit sections. Pollution and the over-withdrawl of water during the spring, summer, and fall months in up-stream portions of the watershed is well documented. This is likely impacting the quality and quantity of water in Hayfork Valley, and contributing to increased summer water temperatures and water quality problems in the lower Hayfork Creek main stem. The CRMP's ability over the next decade to increase summer streamflows and, as a consequence, to improve the quality of the waters, are the most important keys to improving the carrying capacity of lower Hayfork Creek. Such actions will also contribute to reducing temperature problems in the main stem South Fork below Hyampom.

In addition to major withdrawals of water from the middle and upper portions of Hayfork Creek, it is possible fairly high amounts of water destined for Hayfork Creek are being extracted from Olsen Creek. While these withdrawls have minimal effects on lower Hayfork Creek, they could also be contributing to reduced water quality in the lower South Fork.

Both Rusch Creek and the main stem of Hayfork Creek in management unit #4 have been documented to contain excessively high amounts of fine sediment concentrations in both pool and riffle habitats. High fine sediment concentrations are well documented factors which limit the rearing and spawning capability of a stream. Significant landsliding in the Hayfork Creek watershed is not widespread. However, it is very likely that past moderate to high levels of road construction and timber harvesting in the Corral Bottom area of Corral Creek, in Rusch Creek, in selected small tributaries on the south side of lower Hayfork Creek and along the county road are leading to high quantities of fluvial erosion and fine sediment contributions to streams.

High fine sediment concentrations in the main stem of lower Hayfork Creek may be also related to erosion and sediment yield from the upper and middle portions of the Hayfork Creek watershed. Road densities are high in many portions of the Hayfork Creek watershed, and roads with ditches are well documented to extend the stream channel network and result in elevated fine sediment production. Likewise, the effects of wildfires which occurred in the late 1980's, both within the lower Hayfork Creek watershed and elsewhere, may be contributing to increased fine sediment production, which inturn could be limiting the quality of lower Hayfork Creek habitat and its ability to support increased populations of salmonids.

Available data on lower Hayfork tributaries suggests most streams are presently good sources of cool water to the main stem, and have closed riparian canopies. While Olsen, Rusch and upper Corral Creek may be contributing cold water to lower Hayfork Creek, there may be a number of potential erosion threats to water quality which are present in these more heavily managed portions of the lower watershed. These sediment sources could contribute to delayed fisheries recovery in the lower Hayfork Creek watershed.

3. Anticipated future multiple use

At the present time, it is difficult to predict the future level of forest management on industrial and smaller private timberlands. Most private parcels in Corral Bottom have been extensively roaded and harvested over the past several decades.

Likewise, it is difficult to determine the level of future forest management on federally managed lands in the lower Hayfork Creek management unit. STNF has indicated they would like to expand the recently completed Butter Creek watershed analysis to include an analysis of the hillslopes and watersheds located north of the lower main stem Hayfork Creek in management unit #4 (i.e. most of the Pattison Roadless Area). However, a formal timetable for conducting watershed analysis in the lower Hayfork Creek watershed has yet to be established.

In the event watershed analysis does occur in lower Hayfork Creek, one should expect some level of increased forest management by STNF, including (at a minimum) forest fuel load management activities. Much of the lower Hayfork Creek land area is included in the Hayfork Adaptive Management Area. As with management units #2 and #3 (middle and upper South Fork), the lower Hayfork Creek land base could be utilized by USFS researchers who are considering a proposal to experiment with a variety of different silvicultural (harvesting) methods to test timber harvesting effects on the Northern Spotted Owl.

The potential for expansion of agricultural and/or light industry in the vicinity of Olsen Creek and Hyampom could, if not carefully planned and implemented, contribute to elevated temperature conditions and water quality and quantity problems in the lower South Fork. Understanding the minimum quantities of base streamflow to remain in the streams, in order to provide adequate habitat for aquatic species, will be a crucial element of future developments.

4. Proposed watershed and fisheries action items to achieve fisheries restoration

The following prioritized list of actions should be pursued by the CRMP group in order to protect and improve the existing, higher quality fisheries habitats of selected tributaries and to continue to improve main stem habitats.

a) There is little that can be physically undertaken within lower Hayfork Creek and most of its tributary streams to improve the quality or diversity of habitat to host higher populations of salmonids. However, actually realizing improvement in in-stream habitat carrying capacity in the lower Hayfork Creek watershed may be easier to accomplish in this reach than in any other portion of the SFTR watershed. The highest priority activity which could benefit management unit #4 should be proactively working with all landowners in the middle and upper portions of the Hayfork Creek watershed to improve the quality and quantity of water being delivered to lower Hayfork Creek during the spring, summer and early fall months.

b) The next activity needed to improve lower Hayfork Creek main stem habitats for both adult and juvenile salmonids is to reduce the quantities of sediment, and in particular fine sediment contributions, being delivered to lower Hayfork Creek from roads throughout the Hayfork Creek watershed. While this may seem like an immense task, CRMP efforts should target education efforts in proper road drainage techniques. As any public and private road is maintained or worked upon throughout the Hayfork Creek watershed in the years to come, landowners can begin to modify road shape and/or drainage characteristics to begin eliminating the processes of fine sediment delivery to stream channels.

Existing roads within Olsen Creek, Rusch Creek and within watersheds tributary to the Pattison Roadless Area are a high priority for inventories of potential sediment sources. Based on the results, implementing technically sound, erosion prevention activities along roads in the lower Hayfork Creek watershed could substantially reduce future sedimentation. Most lower Hayfork Creek tributaries do not have a history of producing high amounts of sediment associated with past management activities. Correcting any potential erosion problems before they occur can be an important element in maintaining the relatively high quality of tributary habitat.

c) The CRMP should actively cultivate communication, cooperation, and education with smaller landowners to secure a commitment to reduce or minimize the risk of significant, land use caused sediment production in any of the lower Hayfork Creek tributaries during future storms.

d) Future land use activities throughout the lower Hayfork Creek watershed, and particularly in the Pattison Roadless Area, should be carefully selected, planned and implemented so as not to alter natural hillslope and hydrologic processes. Continued protection of these high quality watersheds and their stream channels will be an essential element in improving watershed conditions in both lower Hayfork Creek and in the main stem SFTR below Hyampom.

E. Management Unit # 5: Middle Hayfork Creek between Little & Carr Creek

Management unit #5 includes the middle 12 miles of Hayfork Creek from Carr Creek down to Little Creek. This reach includes five significant tributaries: Tule Creek, Salt Creek, Big Creek, Barker Creek and Carr Creek. This unit is comprised of the low gradient Hayfork Valley with steeply sloping sub-basins. Middle Hayfork Creek is considered to have relatively low sensitivity to cumulative watershed effects related to sediment. However, due to water diversions, lack of riparian cover, and low summer flows, water temperatures in Hayfork Valley become stressful to salmonids during summer and early fall. This reach is a very populated one compared to the other units identified, as it includes the town of Hayfork (population 2,600). Residences and ranches are concentrated along Hayfork Creek and its tributaries within this management unit.

Upper Salt Creek contains many earthflows and rotational landslide features. Lower Salt Creek has incised up to 10 feet, has poor riparian cover, is locally cutting into its banks, and has been impacted by grazing and bank trampling. Placer mining may also be causing ongoing impacts in this reach of the basin. Several recent major wildfires (especially the Barker and Peanut fires) have had negative effects on the watershed as well.

It is estimated that 50% of the land area within management unit #5 is privately owned, with the remainder being managed for multiple use by Shasta-Trinity National Forest or the Bureau of Land Management. Most of the private lands in this management area are for residential use, in combination with some ranching activity.

The prioritization of management units as listed in table 1 indicates that the Middle Hayfork Creek received a fairly low rating for CRMP restoration activities. This low priority rating reflects the fact that this portion of the watershed has few salmonid stocks at risk of extinction, along with only moderate refugia habitat and riparian/water quality conditions. However, these factors, especially the water quality and quantity and riparian conditions, contribute to a high rating for restoration potential for this area. This management unit had the highest response from landowners to the CRMP indicating their willingness to pursue restoration and conservation activities.

1. Role of unit #5 in fisheries recovery

High stream temperatures in summer may limit fish populations throughout most of the South Fork Trinity River Watershed. Improvements in riparian conditions, increased flows (i.e. reductions in diversions), and reduction in temperatures could contribute to fisheries recovery in the basin. Reductions in fine sediment would also improve the chances of recovery by increasing pool depths and spawning success as well as invertebrate production.

The middle reach of Hayfork Creek generally has such severe water quality and quantity problems that fish counts are not conducted because of human health concerns. Residents of Hayfork describe this reach of stream as having much deeper pools prior to the 1964 flood. A significant amount of spawning activity is not currently taking place in this management unit, although some steelhead spawning activity has been observed. The primary role of this unit in assisting fishery

recovery in the watershed would be in improving water quality and increasing stream flow so as to reduce water temperatures in downstream areas.

2. Limiting factors to fisheries recovery and restoration potential

Water quality and quantity are the major limiting factors to fisheries recovery in this management unit. Water diversions and water pollution along with high summer water temperatures are negatively affecting fish habitat in this reach and in downstream reaches. Landowners willingness to allow restoration work to take place on their land is also necessary. In management unit #5 it is important to pursue conservation practices to reduce water use and to allow for adequate riparian habitat to protect and shade the streams in order to reduce temperatures. In many cases this may mean fencing off the riparian zone to protect it from cattle.

3. Anticipated future multiple land use

It is anticipated that future land use on forest land and BLM land will be at relatively low activity levels. The rate of road construction and timber harvesting in this management unit have recently been fairly low compared with previous decades.

The Forest Service is planning to prepare a watershed analysis for Salt Creek in 1996. It could be expected that a combination of timber harvesting and erosion control projects will be an outcome of the analysis.

It is also believed that fuels management will play an increasingly important role in the land management, especially around the larger communities such as Hayfork. Catastrophic forest fires could be devastating in areas that are heavily populated.

All of the land in management unit #5 is a County designated Critical Water Resource Overlay Zone, although much of this land is zoned unclassified at this time. The Hayfork Community Plan Committee is currently in the process of formulating land use designations and specific zoning for consideration by the Board of Supervisors. Once these recommendations are acted on, a broader scope of future anticipated land use could be developed.

4. Proposed watershed and fisheries action items to achieve fisheries restoration

The CRMP should continue working proactively with landowners in management unit #5 to improve the quality and quantity of water during the summer and fall months. Efforts to reduce water temperatures through a riparian revegetation program utilizing a mix of conifer and deciduous species should continue, as well as additional reductions in water diversions through installing more efficient delivery systems and improvements in irrigation operations. Continued monitoring of water quality conditions along this reach of Hayfork Creek is important, especially in demonstrating the need for a sewage treatment plant for the community to improve water quality.

Planning for implementation in this reach includes conducting a riparian inventory to assess the "critical need" locations for riparian habitat improvement projects. This inventory will result in digital coverages consisting of plant community types, vegetation density, percent composition and canopy cover, geomorphology/hydrology and streambank erosion sites. This process will enable restoration planners and implementors to more directly target areas and landowners that have less than desired conditions for fish habitat.

Plans for this management unit are to proceed with additional riparian exclusionary fencing, revegetating riparian zones, upland fuels reduction and erosion control projects on private lands, water quantity and quality projects such as piping old, leaky irrigation ditches. There is also an ongoing and expanded monitoring program along this reach to assess both baseline conditions and to determine other "critical need" projects, as well as for assessing the effectiveness of the various restoration projects implemented in the basin to date. Monitoring data including summer water temperatures, stream flows, and water quality parameters such as pH, E.Coli, and macroinvertibrate samples. The CRMP has been successful in reaching many of the major landowners in management unit # 5 and significant restoration efforts have already been implemented along Salt Creek, Carr Creek, Tule Creek and Big Creek with plans for additional work along Tule, Carr, Barker, and Big Creeks scheduled to be implemented in 1996.

The potential to participate in an interagency effort with the Forest Service & NRCS to prepare a Watershed Analysis for areas which include private lands where restoration work would be valuable is being explored.

Agricultural assistance is planned for ranches in the Middle Hayfork Creek unit, including providing irrigation plans for water conservation and improved production, pasture improvements, livestock management such as cross fencing and rotational grazing, and possibly acquiring a no-till drill for seeding while minimizing soil disturbance.

Utilizing the Klamath Resource Information System (KRIS) as a depository for the collected information for data management and as a tool for restoration project planning purposes is also being discussed. This system will enable the RCD and NRCS to bring visual aids to landowners to discuss needs for restoration, produce quality presentations, and facilitate technology transfer.

Through the CRMP's outreach and education of landowners in the basin, it should be demonstrated that restoration projects could be viewed as an economically sound proposal for the landowner, as well as enabling the landowner to get involved in the bigger picture by being a part of the solution in fishery enhancement in the South Fork Trinity River watershed.

F. Management Unit #6: Upper Hayfork Creek between Carr Creek and the headwaters

Management Unit #6 includes the upper 28 miles of the main stem Hayfork Creek and the adjacent hillslopes and tributary sub-basins between the mouth of Carr Creek and the headwaters of Hayfork Creek. Only one significantly sized tributary stream, the 26mi^2 East Fork Hayfork

Creek sub-basin, drains into the reach. Dubakella Creek, a 7mi^2 watershed, is the next largest tributary stream to upper Hayfork Creek and it is located upstream of the town of Wildwood. The remaining tributary watersheds to the upper Hayfork Creek watershed include approximately three to four dozen small, average 3mi^2 in watershed area, steep, largely non-fish bearing streams and gulches to upper Hayfork Creek.

Approximately 25% of the land area within management unit #6 is privately owned. Of this, about two-thirds is located in the upper half of the East Fork Hayfork Creek watershed, and the remainder is largely concentrated in the vicinity of the town of Wildwood and, to a lesser degree, around the mouth of the East Fork. Private lands in the upper half of the East Fork have been used for timber production and livestock grazing purposes. Much of the private lands in the vicinity of Wildwood and the mouth of the East Fork are primarily utilized for ranching, agriculture and residential purposes, and to a lesser degree, for timber production. The remaining 75% of the land base in the upper Hayfork Creek management unit is federally owned land administered by the South Fork Management Unit formerly the Hayfork and Yolla Bolla Ranger Districts of STNF.

Most of the upper watershed above Dubakella Creek was severely burned in the late 1950's, and is referred to as the "Jones Burn." Extensive road construction and fire salvage activities occurred within the Jones Burn area into the early 1960's. The upper Hayfork Creek watershed was spared from the major fires which occurred throughout many areas of the SFTR watershed in the late 1980's. However, smaller fires frequently occur associated either with lighting strikes or arson.

The upper Hayfork Creek watershed has historically been more heavily mined, with placer and dredge techniques, than any other portion of the SFTR watershed. Mining activity was concentrated in two time periods, the late 1880's to the early 1900's and during the 1930's to 1940's. Much of the main stem along Hayfork Creek and up the East Fork, and the adjacent streamside terraces, between Carr Creek to near Dubakella Creek was mined for gold during these time periods.

A fairly high number of streamflow diversions are reportedly present in the Wildwood portion of the watershed, and a major irrigation ditch, located above the East Fork Hayfork Creek, takes high volumes of water from Hayfork Creek during the spring and summer months. Diverted water is largely used for ranching and agriculture.

The CRMP prioritization strategy (Table 1) indicates the upper Hayfork Creek management unit will not play a major role in restoring larger populations of wild salmonids to the SFTR watershed. As will be discussed below, much of the low importance is a result of access limitations to adult fish during drier water years and the fact that the reach primarily provides spawning and rearing habitat for only steelhead salmon. However, efforts to improve the quantity and quality of water being delivered from the upper Hayfork Creek watershed, as well as reducing the quantity of sediment being produced from roads and land use activities can prove very important in improving habitat conditions in other downstream SFTR management units.

1. Role of reach #6 in fisheries recovery

The upper Hayfork Creek management unit can be divided into 2 distinct reaches of the main stem and associated tributary watersheds based on the potential of the reach to host different species of salmonids. A major waterfall is located in the main stem approximately 1 mile upstream of the confluence of the East Fork Hayfork Creek. Approximately one-third of management unit #6 is below the falls and two-thirds of the land base is above the falls. The falls are considered by most professionals and local residents to be a physical barrier to migration for all species of salmon except steelhead.

Prior to the 1964 storm, spring chinook, and during years with high fall streamflows, possibly fall chinook utilized the main stem Hayfork Creek below the falls for both spawning and rearing. While the reach would have historically produced only a small percentage of the total SFTR population of spring and fall chinook salmon, improving the condition of stream habitat in the lower reach below the falls could contribute to recovery of these runs in the SFTR watershed. Fish surveys conducted in the reach below the falls in 1990 noted fairly high densities of juvenile steelhead, and lower densities of juvenile chinook salmon were also observed. This indicates that in some water years, a few adult salmon are still attempting to utilize the reach as habitat continues to improve.

Above the falls, steelhead are the only species of salmon which have access to the reach. With the exception of Dubakella Creek, most tributaries streams above the falls have minimal amounts of spawning habitat available to adult steelhead. As a result, the ability of upper Hayfork Creek to produce steelhead is dependent, in a large part, on the presence of high quality spawning and rearing habitat in the main stem. Observed juvenile steelhead densities above the falls are low for young of the year steelhead, and very low for one- and two- year old juveniles when densities are compared to other portion of the SFTR watershed. Low densities of fish above the falls may indicate that in low winter streamflow water years, the falls may also be a barrier to adult steelhead migration into upper Hayfork Creek. The intermittent ability of fish to annually have access to the upper two-thirds of Hayfork Creek, coupled with the fact it provides habitat for only one species of salmon, is largely responsible for the unit being a low priority for focusing CRMP activities.

While the upper Hayfork Creek management unit will likely play a minor role in producing significant quantities of salmon, it is still important as a producer of steelhead, and will play an important role in improving the condition of downstream water quality and habitat. Both main stem and tributary streams contain a good mix of habitat types (i.e. pools, runs, riffles, etc.), but most stream surveys indicate fairly high concentrations of fine sediment in pools and spawning habitat. Most tributary streams serve as good sources of cool water which may be the principle factor allowing the level of salmonid production we see in the reach.

2. Limiting factors to fisheries recovery and restoration potential

Potential impacts which occur in the upper Hayfork Creek management unit influence fish recovery not only in upper Hayfork Creek, but throughout the rest of Hayfork Creek and the lower main stem South Fork Trinity River. Past mining activities, as well as high rates of erosion from the Jones Burn area during the 1964 storm caused significant impacts to stream channels in upper Hayfork Creek. However, considerable channel recovery has already occurred in both main stem and tributary habitats.

The principal in-river limiting factors to improving the ability of the upper Hayfork Creek watershed to support increase numbers of adult and juvenile salmonids are: 1) most importantly, improving the quality and quantity of waters being delivered to the reach, and 2) reducing fine sediment concentration from roads and managed areas within the upper Hayfork Creek watershed. A third important factor is the continued protection of existing high quality watershed and water quality values within the lower watershed tributaries.

Habitat typing surveys indicate high amounts of fine sediment is present throughout the main stem and the East Fork Hayfork Creek, and this is likely the major limiting factor to fish production within the upper Hayfork Creek management unit. High rates of water diversion is probably the land use activity in upper Hayfork Creek which is causing the greatest affect on lower and middle Hayfork Creek habitat and its ability to support increased populations of salmonids. Disturbance to streamside riparian areas in portions of the upper watershed, most notably in the vicinity of Wildwood, near the mouth of the East Fork and in the East Fork Hayfork Creek sub-basin may also be contributing to marginal stream water temperatures.

Addressing these limiting factors to fisheries recovery will not be difficult in this reach for several reasons. Road densities are fairly low throughout many sub-basins, thereby facilitating more rapid control of fine sediment contributions from roads within the area. In order to gain significant increases in streamflow to upper Hayfork Creek, it only requires the cooperation of a small number of landowners. By working with these landowners to improve the productivity of their lands, while increasing streamflow, the likelihood of rapidly improving water quality and quantity is high. Finally, areas in need of riparian improvements or protection are not widespread throughout upper Hayfork Creek, and most areas in need of improvements are

located in alluvial stream reaches. These are the easiest areas to rapidly begin to see results from efforts at improving riparian conditions.

3. Anticipated future multiple land use

It is anticipated that future land use on federal land will be at a relatively low activity level for the next decade. While the area is within the Hayfork Adaptive Management Area, no watershed analysis has been proposed for any of the federal lands within the management unit. With the possible exception of forest fuel reduction efforts, low levels of road construction and timber harvesting should remain low.

At this time, it is difficult to predict what level of forest management will occur on the large tract of private land in the East Fork Hayfork Creek watershed. Given the types of agriculture and grazing practices which are occurring on the remaining private parcels in the upper watershed, it is unlikely significant changes in land use could occur.

4. Proposed watershed and fisheries action items to achieve fisheries restoration

a) The CRMP should continue working proactively with landowners in management unit #5 to improve the quality and quantity of water during the summer and fall months.

Efforts to reduce water temperatures through a riparian revegetation program utilizing a mix of conifer and deciduous species should continue, as well as additional reductions in water diversions through installing more efficient delivery systems and improvement in irrigation operations. Continued monitoring of water quality conditions along this reach of Hayfork Creek is important.

b) The next activity needed to improve upper Hayfork Creek main stem habitats for both adult and juvenile salmonids is to reduce the quantities of sediment, and in particular fine sediment contributions, being delivered to upper Hayfork Creek from roads throughout the Hayfork Creek watershed. CRMP efforts should target education efforts in proper road drainage techniques. As any public and private road is maintained or worked upon throughout the Hayfork Creek watershed in the years to come, landowners can begin to modify road shape and/or drainage characteristics to begin eliminating the processes of fine sediment delivery to stream channels.

Existing roads within the East Fork Hayfork Creek and Dubakella Creek, as well as the County Road parallelling the main stem Hayfork Creek are the highest priority for inventories of potential sediment sources. Based on the results, implementing technically sound, erosion prevention activities along roads in the upper Hayfork Creek watershed could substantially reduce future effects from sedimentation. Most upper Hayfork Creek tributaries, with the exception of the Jones Burn area, do not have a history of producing high amounts of sediment associated with past management activities. Correcting any potential erosion problems before they occur can be an important element in maintaining the relatively high quality of tributary habitat.

c) The CRMP should actively cultivate communication, cooperation, and education with smaller landowners to secure a commitment to reduce or minimize the risk of significant, land use caused sediment production in any of the lower Hayfork Creek tributaries during future storms.

d) Water quality monitoring efforts should be expanded in upper Hayfork Creek in the vicinity of State Highway 36 to determine if there are any water quality problems associated with the former timber mill site.

XI. Economic Benefits and Conformity to Existing Plans

Restoration of a healthy fishery to the South Fork Trinity River Basin would be an economic benefit to the community. The recovery process will provide needed jobs in stabilizing watersheds and enhancing habitat as well as bring additional technology and information to local farmers and ranchers to operate their businesses more effectively. It will also help the Hayfork community with its critical water shortage and domestic wastewater problems. Positive changes in forest land use practices will assist in the efficient utilization of valuable forest products while ensuring watershed protection and the sustainability of the resources including fish and wildlife habitats. The revitalization of fisheries resources could provide an additional economic stimulus to local communities by increasing tourism and sport fishing.

The South Fork Trinity River Basin is an economically depressed area, with high unemployment rates and low income figures compared to most other areas in the state of California. Much of the population of this area had relied on timber production in the past. Balancing the health of the communities along with the protection of resources is necessary. Land use, especially forest management and ranching, needs to be performed in a way that improves water quality and quantity in order to return a healthy, productive fishery.

Implementing feasible modifications to current land management practices could provide for a net economic benefit to landowners by improving land values through the reduction of erosion and by improving water quality and quantity, as well as reducing some of the previously mentioned limiting factors currently preventing fisheries recovery.

The recommendation of the Hayfork Community Plan Advisory Committee is to encourage restoration and conservation efforts to improve the quality of life for residents and to enhance the prospects of tourism. This would potentially stimulate the recreation-related economy of Trinity County. Thus, this plan is in conformity with existing and upcoming Trinity County Plans.

XII. Implementation Schedule

Implementation as outlined in the Priortization Strategy will provide the greatest benefit for the anadromous fishery. However, funding and the cooperation of landowners is of paramount importance in order to accomplish conservation projects in the basin. It should be noted that wherever projects are undertaken in the basin the fisheries should be enhanced. The CRMP has directed that conservation projects be implemented in cases where benefits to the resources and fisheries exceeds the cost.

XIII. Signature Page

We, the undersigned, have participated in the Coordinated Resource Management Planning process for the South Fork Trinity River Basin. We concur with and will support the decisions, needs, and actions contained herein.

NAME AFFILIATION

_____

_____

_____

_____

_____

APPENDIX A

MEMORANDUM OF UNDERSTANDING

For Participants in the
South Fork of the Trinity River Coordinate Resource Management Plan

CRMP PROCESS

The concept underlying the CRMP process is that voluntarily working together results in improved resource management and minimizes conflict among landowners, land users, government agencies, and interest groups. Rights and obligations of all participants are respected. Trust and mutual respect are important byproducts. Under this approach, resource issues are faced and resolved more effectively because solutions are based upon resource boundaries and are not constrained by individual, agency, or political preference.

This Memorandum of Understanding (MOU) is the initial step in the CRMP process and provides the framework under which future plans are developed and implemented. Group operating guidelines, sub-watershed plans and specific projects can be prepared later under the sphere of the MOU. Participation in the CRMP process is strictly voluntary.

CRMP PARAMETERS

I. GOAL: The goal of the South Fork of the Trinity Resource Management Plan is to protect, improve and maintain the fisheries, natural resources, and economies of the South Fork Trinity River.

II. SUPPORT: Support for this group falls under the guidance of three separate but cooperating agencies and/or organizations.

- Under Chapter III, Section D of the California Memorandum of Understanding on Biological Diversity, direction is given to signatory agencies to encourage local watershed and landscape associations. A similar agreement exists between agencies responsible for the management of the Trinity River watershed.

- The Trinity River Task Force has also given its approval and financial support to this CRMP process.

- The third group supporting this group to be formed is the Fishing, Farming, and Forestry coalition. FFF is a private association consisting of people who depend, own, or subsist on resources that will be affected by the listing of anadromous fisheries under the ESA. Their initial goal is to develop and implement a recovery plan for California's coho salmon.

The combined support of the aforementioned groups serves as a catalyst for this group to proceed and implement a CRMP for the South Fork of the Trinity River.

III. MUTUALLY AGREED AND UNDERSTOOD BY ALL PARTIES

A. This agreement is executed as of the last date shown below and expires no later than May 31, 2000 at which time it is subject to review, renewal, or expiration.

B. This agreement is neither fiscal nor a funds obligating document. Any endeavor involving reimbursement or contribution of funds between the parties to this agreement will be handled in accordance with applicable laws, regulations, and procedures including those for government procurement and printing. Such endeavors will be outlined in separate agreements that shall be made in writing by representatives of the parties and shall be independently authorized by appropriate statutory authority. This agreement does not provide such authority. Specifically, this agreement does not establish authority for noncompetitive award to any party to this agreement of any contract or other agreement. Any contract or agreement for training or other services must fully comply with all applicable requirements for competition.

DECLARATION

We, the undersigned, commit to assist and cooperate in achieving the stated goal for the South Fork Trinity River in accordance with the conditions stipulated above.